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Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

Vol. 96 February 17, 1934 No. 7

WE DO OUR PART

In This Issue

Should Railway Freight Service Be Advertised? ..... Page 250

This is Article No. 19 of the Traffic Development Series; it discusses recent trends toward the employment of advertising and calls attention to improvements in railway transportation which offer opportunity for its effective use.

Centralized Traffic Control Replaces Staff System on G. T. W. 255

A description of the installation on a 5¼-mile section of single track between two ends of double track at Sedley, Ind., and Valparaiso where an investment of $5,000 has brought annual savings of $6,000.

Motor Cars and Trailers for the Pennsylvania Electrification 259

R. H. Stoberg, of the General Electric Company, and Charles Kerr, Jr., of the Westinghouse Electric & Manufacturing Company, tell how motor-trailer combination reduces electrical parts almost by half.

EDITORIALS

Government Ownership and the Fears of Investors 247
Rail Travel Constantly More Attractive and Economical 248

GENERAL ARTICLES

Should Railway Freight Service Be Advertised? 250
Motor Trucking Code Effective February 25 253
Freight Car Loading 254
Centralized Traffic Control Replaces Staff System on G. T. W. 255
A Machine for Cleaning Tank Cars 257
Motor Cars and Trailers for the Pennsylvania Electrification, by R. H. Stoberg and Charles Kerr, Jr. 259
Air-Seasoning of Wood for Preservative Treatment, by W. E. Jackson 263
C. T. C. in Philadelphia Subway 266

NEW BOOKS 266

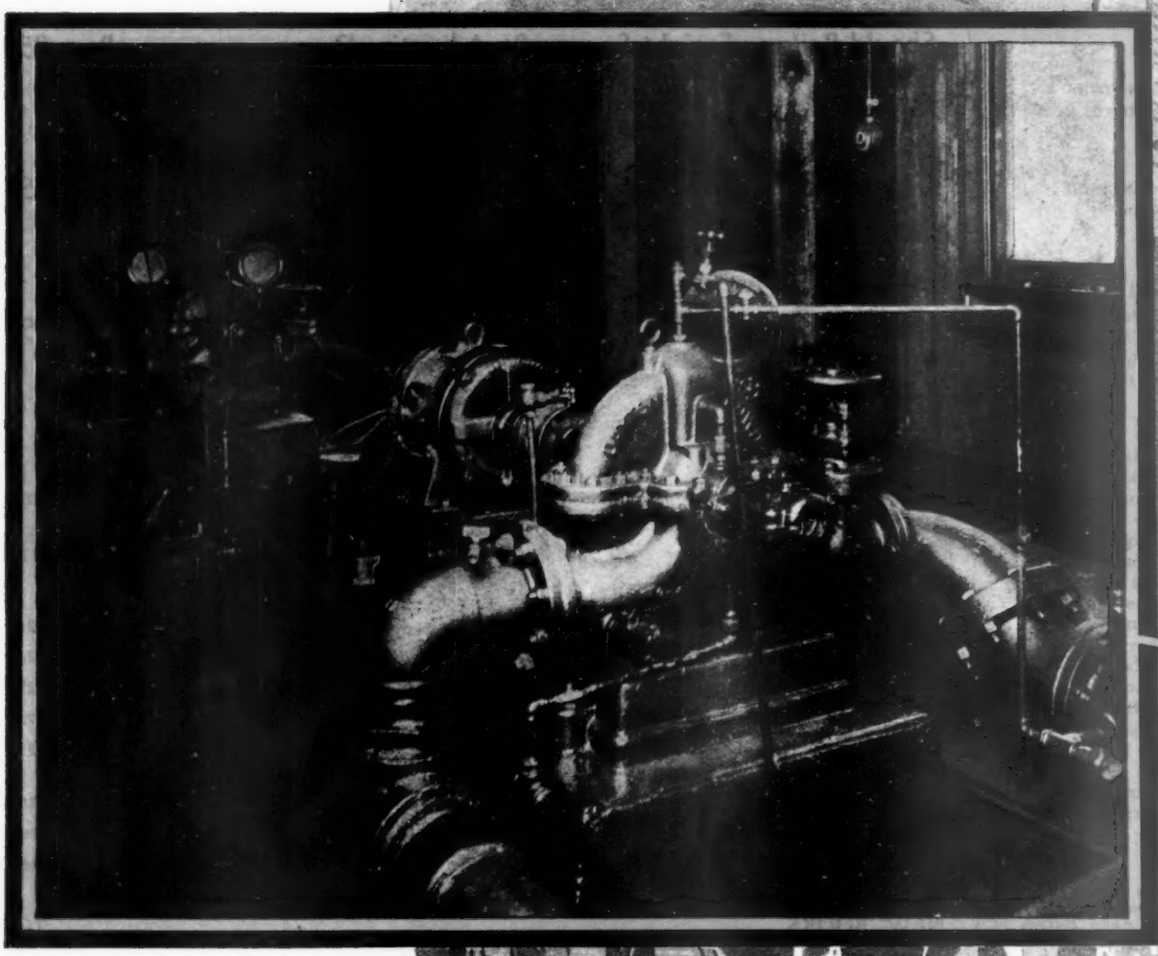
COMMUNICATIONS 267

ODDS AND ENDS 268

NEWS 269

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

They HALVED their



Interior of a typical automatic electrically-operated pumping station. The two 300 gallon per minute centrifual pumps are each driven by 15-hp. CS Westinghouse motors.

Government Ownership and the Fears of Investors

After expressing in his first report his belief that public ownership and operation will be the ultimate solution of the railroad problem, Joseph B. Eastman, Federal Co-ordinator of Transportation added, "If and when that time arrives, the impelling motive will probably not be logic or theory, but the practical one that private enterprise and capital will not be able to carry on successfully. That has been the general experience."

What conditions and causes might make it impossible for private enterprise and capital to carry on? The railways will require large increases in their net earnings to enable them to refinance with private capital their outstanding obligations as they come due, and to enable them to raise the new capital needed for improvements, especially to meet competition and reduce operating expenses. Given adequate increases in net earnings, they will be able to carry on successfully under private ownership. Without them they will be unable to do necessary financing. The one thing which will make government ownership inevitable, if it becomes inevitable, will be lack of the actual and prospective net earnings required to inspire the confidence of investors.

Mr. Eastman on Attitude of Investors

"The present attitude of investors is a most important factor for consideration," said Mr. Eastman elsewhere in his report. "To ascertain this, a member of the co-ordinator's staff interviewed numerous officers who have charge of the investment of large amounts of capital for insurance companies, banks, and like institutions, as well as large personal investors. He found that they are beset by fears with respect to railroad investments. The confidence inspired by the provisions of the Transportation Act, 1920, has gone and disillusionment has taken its place." Why have those from whom the railways have, in the past, been able to get capital for refinancing and for expansion and improvements lost the confidence inspired by the Transportation Act? One reason not mentioned by Mr. Eastman is that the Interstate Commerce Commission did not give effect to the rate-making provisions, and they have now been repealed. Reasons mentioned by Mr. Eastman include, "the competition of motor trucks and other transportation agencies, the obsolescence and probable abandonment of much railroad property, what may happen from monetary inflation, the operation of the new Securities Act, the construction of the St. Lawrence waterway, the neglect of railroad maintenance, increase in taxation, domination of labor, the possibility that underlying securities will not be sufficiently protected in reorganizations, the delay in effecting railroad consolidations, regulation by the Commission, and a host of other things. Whether or not these fears are justified is not here the point. The evidence is convincing that they prevail in the investing class, and exert a most serious influence."

These statements of Mr. Eastman, taken together, are of great importance. The adoption of government ownership of railways would produce political and economic effects of the first magnitude. A large majority of the people of the country want to avoid it because they regard these effects with deep apprehension. Mr. Eastman, who does not share these apprehensions, indicates clearly in the statements quoted how and why the adoption of government ownership will occur, if it ever does. It will be because such fears of investors as he mentions are justified. By the same token, the way to avoid government ownership will be to show that these fears *are not* justified by removing their causes. Private ownership cannot be maintained if investors are to be given reason to fear indefinitely that the railways cannot "come back" financially.

Proposals Harmful to Railroads

What, then, is being done, or is being proposed shall be done, by government to help or handicap the railroads? They are being made and offered loans with which to tide them over the present crisis and enable them to increase their expenditures for the purposes of rehabilitating their properties and contributing toward the improvement of general business, but unless their net earnings largely increase these loans may prove a burden rather than a blessing. The Rayburn bill for the regulation of carriers by highway has been introduced in Congress, but is making slow progress. Numerous bills to increase railroad operat-

ing expenses are being introduced at the instance of organized labor. These include bills for a six-hour working day, to limit the length of trains, and providing pensions for employees. In the aggregate the increased operating expenses caused would amount to hundreds of millions of dollars—probably to more than the largest amount of net operating income that the railways ever earned. The construction of the St. Lawrence waterway would divert traffic from the eastern lines. The Tennessee Valley power project will destroy a large amount of the coal traffic of the railways in its territory. Bills have been introduced for power projects in the Missouri Valley and in the areas drained by the Arkansas, Red and White rivers, which similarly would reduce railway coal traffic.

"Because of recent and continuing improvements in fuel power generation, it is evident to all informed engineers," said Frank R. Innes, western editor of Electrical World, in a recent address before the St. Joseph Valley Section of the American Society of Mechanical Engineers at South Bend, Indiana, "that generation of electricity by water power plus transmission and distribution to the places of electricity use is rapidly becoming a more costly and less socially desirable process than local electrical generation by fuel power." Consequently, what these proposed large government expenditures for the generation of electricity by water power contemplate, is not only the incidental reduction of the production and transportation of coal, but the creation of means of producing and distributing electricity at a higher cost than is incurred in producing and distributing it by steam power. The total taxes paid by the railroads have declined during the depression, but relatively they have increased because they take more cents out of each dollar of gross revenues now than ever before.

Scared Investors and Business Revival

Perhaps one of the most extraordinary incidents that ever occurred in Congress was the passage by the Senate on February 1, without a record vote, of a resolution introduced by Senator Norris of Nebraska, requesting the president to send to the Senate "a comprehensive plan for the improvement and development of the rivers of the United States, with a view of giving to Congress information for its guidance in legislation which will provide for the maximum amount of flood control, navigation, irrigation, and development of hydro-electric power." In this and other similar measures introduced, there has appeared nothing to indicate that any consideration is to be given to whether irrigation to increase farm production is needed, or the proposed navigation will result in cheaper transportation, or the proposed development of hydro-electric power will result in cheaper production of power, or as to the effect that will be produced on capital already invested in private industry by the investment of the taxpayers' money in competition with it.

Do the people of the country believe the confidence of investors in railway securities essential to the avoidance of government ownership will be restored by failure of Congress to pass any legislation to reduce the unfair competition to which the railways are subject, and by the enactment of legislation which would greatly increase their operating expenses, and restrict the increase of their traffic? A vital requisite to a revival of all private business is the restoration of the confidence of investors in the future earning capacity of the great basic industries of the country, including the railroads and the companies that produce electrical power. Do the people believe the confidence of private investors in the earning capacity of the country's great basic industries can be fully restored in the face of wholesale threats to use the power of government to increase their operating expenses, and, at the same time, reduce their business?

Mr. Eastman referred to the operation of the new securities act as one of the reasons why those who control large amounts of capital "are beset by fears with respect to railroad investments." Probably the securities act does interpose serious obstacles to the investment of large amounts of private capital in private industry, but fears being created by the adoption and advocacy of radical government policies as to whether the principal and interest of new capital, after it has been invested, will be safe are and will be, until they are removed, a more formidable obstacle to the investment of private capital than the securities act.

Rail Travel Constantly More Attractive and Economical

Speed in transportation—effective speed, that is to say—is not simply the miles per hour which a vehicle can be made to travel, nor yet is it the elapsed time in which a journey may be made between two points under exceptionally favorable circumstances. In a world of business, when for most people even time to be allowed for pleasure travel must be known in advance, the only effective speed is one which can be relied upon under all circumstances. Without in any way deprecating the convenience or speed of other forms of transportation upon occasion, it is still true that the only transport agency which can be relied upon sufficiently at all times to enable business plans to be made in advance around it is the railroad.

We hear much of the rapidity of airplane travel, and how, for instance, such service has brought New York and Chicago within four or five hours of each other. What we do not hear so much about are the times when weather conditions are such that New York and Chicago are a week apart by air transport and when its effective speed thus suddenly declines from 150 miles an hour or more to that of the horse drawn canal boat. But at such times, just as in fair weather,

the trains between the two cities continue to operate, and very seldom indeed are they even a few minutes late.

The *Railway Age* has offices in New York and Chicago and for many years has made use of the Twentieth Century and the Broadway Limited for important interoffice correspondence, and not in memory has the mail ever failed of delivery on the day following its dispatch. We have also used the air mail extensively and have found in our experience that its batting average—i.e., of delivery the next day—has not worked out much better than 75 per cent, if it has done that well. In spite of the advances made by air transportation, therefore, the minimum time interval which separates New York and Chicago continues to be, for all practical purposes, 17 hours and 45 minutes, the running time of the "Century" and the "Broadway."

Motor transport, it is true, can operate in weather when airplanes cannot be flown, but it is rendered slow, dangerous and uncomfortable by conditions which affect the quality of railway service scarcely at all. Thousands of persons who thought, possibly, that they would never need to avail themselves of the railways again, have recently had occasion to turn to them once more by reason of the handicap offered to motor transport by the severity of the weather. In view of the continued dependence of the public on the railways for passenger transportation, in spite of the rapid advances made in highway and air transportation, it is gratifying to note that steady strides have been and are being made, despite unfavorable business conditions, to accelerate and otherwise improve railway passenger service.

Long-Distance Train Schedules—January, 1934, Compared with January, 1929

	Miles	Jan. 1929 Fastest Schedule	Jan. 1934 Fastest Schedule	Reduction in Elapsed Time %
New York — Boston	229.1	5 hr. 10 min.	4 hr. 45 min.	— 8
New York — Pittsburgh	439.9	9 hr. 18 min.	8 hr. 59 min.	— 3
New York — Washington	226.5	4 hr. 40 min.	4 hr. 15 min.	— 9
New York — Montreal	384.	10 hr.	9 hr. 35 min.	— 4
New York — Miami	1386.	35 hr. 45 min.	28 hr.	—22
New York — Chicago	961.2	20 hr.	17 hr. 45 min.	—11
Chicago — Los Angeles	2228.	63 hr.	56 hr.	—11
Chicago — Seattle	2190.	68 hr.	59 hr. 15 min.	—13
Chicago — San Francisco	2258	63 hr.	60 hr. 55 min.	— 3
Chicago — Montreal	848	22 hr. 25 min.	18 hr. 10 min.	—19
St. Louis — Dallas	688.2	18 hr. 25 min.	17 hr. 45 min.	— 4
St. Louis — Kansas City	278.7	7 hr. 28 min.	7 hr. 6 min.	— 5
Washington — Detroit	684.2	17 hr. 50 min.	16 hr. 15 min.	— 9
Toronto — Montreal	334.	7 hr. 40 min.	6 hr. 30 min.	—15
San Francisco — Portland	771.	21 hr. 55 min.	21 hr. 35 min.	— 2
Cincinnati — St. Louis	339.	8 hr. 30 min.	7 hr. 30 min.	—12
Richmond — Cincinnati	580	17 hr. 10 min.	14 hr. 24 min.	—16

The extent of the continued improvement in speed is indicated in the accompanying table, which shows the fastest train schedules between important cities chosen at random from the Official Railway Guide—January, 1934, being compared with the same month of 1929, before the advent of the depression. The increases noted are all the more remarkable in view of the scarcity of funds needed to bring track, signals and equipment up to the standards necessary to permit acceleration without sacrificing either safety or comfort. Of the increased speeds, that between New York and Miami is particularly noteworthy, and even more so when it is recalled that the 1929 schedule itself represented a marked acceleration over that of a few years before.

The completion of the Union Pacific and Burlington stream-lined motor trains, with others to follow them shortly, holds promise of still further improvement soon to come but, even without this, the American railways stand in the forefront of the railways of the world in the operation of long-distance trains at high sustained speeds. England, and more recently Germany and France, have some trains operating over relatively short distances which exceed the start-to-stop speeds of most American trains, but, when it comes to sustained high speeds over long distances with trains which weigh twice as much as those in Europe, the American railways have few equals and no superiors—a fact which English observers very readily acknowledge. For example, the Railway Gazette (London) has recently pointed out that the famous L.M.S. train, the Royal Scot, which was exhibited at the Century of Progress Exhibition at Chicago, would have to have its schedule for the run from London to Edinburgh reduced by 45 minutes before it would equal the average speed which the Broadway and Twentieth Century Limiteds maintain over a distance more than twice as great. Not only is this so but, says the Railway Gazette, in America "long-distance high speed is combined with strict punctuality, which could hardly be claimed here."

Not only is railway passenger service much faster than it was before the depression. It is also more comfortable and much cheaper. In January, 1929, the average revenue per passenger-mile was 2.968 cents. In November, 1933, the latest month for which statistics are available, the average revenue had declined to 2.041 cents—a reduction in price to the passenger of more than 31 per cent. It is certain that the average cost to the passenger was still further reduced in December, since it was that month in which the widespread reductions in rates became effective in Western territory.

Combined with the higher speeds and lower prices, the railways have greatly extended air conditioning and are continuing it so that the time is now in sight when train travel will become generally clean and comfortable under all circumstances to the same extent that it is now safe and reliably fast. In short, traveling by train has become one of the greatest bargains which American industry is offering to the public, and that the public is becoming aware of this is shown by the fact that the constant decline in the volume of traffic which occurred with few interruptions since 1923 appears finally to have been arrested. By contrast, every month of 1933 since May showed an increase in the volume of traffic over the same month in the preceding year. As the public becomes more widely acquainted with the improvements which have been made in service and prices, it may be expected that this upward tendency will become even more pronounced.

Should Railway Freight Service Be Advertised?

Trend recently toward employment of advertising—Improvements in railway transportation offer opportunity for effective use

ONE of the largest-selling "unadvertised" products, if not definitely the largest-selling, is railway freight transportation. This principal product of the railways has sold in the past to an amount of nearly $5,000,000,000 per year. Even last year, when the country was in the depths of its worst business depression, approximately $2,500,000,000 worth of railway freight transportation was sold, far more than the wholesale value of all motor vehicles, parts and tires produced during the year. Yet railway freight transportation, in marked contrast to the products of the automotive industry, has been advertised, if at all, only upon a narrow scale, so that the railways' basic product, from the practical standpoint, can almost truly be described as unadvertised, so far as the general public is concerned. Although freight advertising has been argued pro and con for a number of years, such advertising as the railways have done has been devoted almost exclusively to that smaller proportion of their transportation product represented by railway passenger service.

The Pros and Cons of Freight Advertising

Various reasons have been advanced for the failure of the railways to use advertising in the promotion of their freight business. It has been said that the volume of freight traffic is determined solely by general business conditions and is not susceptible to expansion by advertising or any other form of railway selling effort. It has been said that the routing of freight is determined by physical or other conditions, that railroad service is completely standardized and, consequently, that advertising could not possibly affect the traffic situation. With only a certain amount of potential business, it has been said that advertising by one railway would simply be duplicated by the advertising of its railway competitors, so that all would assume an extra and unnecessary expense with no possibility of increased return. Finally, it has been said that freight traffic cannot be secured by advertising but is influenced only by personal solicitation.

The advocates of the use of advertising to promote the sale of railway freight transportation contend, however, that even if these conditions did exist in the past, they no longer prevail; that the methods which may have been the best which the railways could devise during the years of their monopoly of the freight transportation business of the country are no longer adequate because of the entrance of keen competition. They point to the already substantial and still widening band of traffic which is today handled not by railways but by railway competitors, setting up a margin of traffic toward the solicitation of which the railways need to project their best selling efforts. Just what this margin of currently non-railway traffic amounts to in dollars and cents of freight revenue, no one knows exactly. However, exhaustive analyses of the freight taken from the railways by motor trucks in a number of middle western states indicate that, in 1931 alone, truck competition took from the railways of the country freight traffic which would have brought the railways, had they retained it, revenues of between $500,000,000 and $600,000,000. Surely, say the advocates of use by the railways of every possible means of increasing their freight business, this is a mark worth shooting at.

A Traffic Solicitor in Printed Form

In reply to the claim that traffic is controlled by conditions beyond the influence of railway traffic departments, the proponents of freight advertising ask why, then, should railways employ freight solicitors? If railways need freight solicitors—and this need is unquestioned—then they also need freight advertising, which is simply a traffic solicitor in printed form, in the judgment of those advocating the use of this effective selling arm. They call attention, furthermore, to the fact that freight transportation is no longer completely standardized; that railway transportation is different from competitive forms of transportation, and even the

We **CALL FOR—HAUL—DELIVER**

Less-than-carload

FREIGHT

All you do is Telephone—

PENNSYLVANIA RAILROAD

We take full responsibility—make just one charge for the whole door-to-door operation. Phone your local Pennsylvania freight agent.

DOES THE REST

Pennsylvania Advertising in Newspapers and Magazines Is Telling the Public of the New Complete Freight Service Now Available

service rendered by some railways now differs from that offered by others, giving the railways something definite to talk about in freight advertising.

Personal Solicitation vs. Freight Advertising

Finally, on the question of personal freight solicitation versus freight advertising, it is pointed out that no soliciting force can possibly call upon all shippers, large and small. The findings of one road which made a complete check of its shippers and the amount of business secured from them is cited. This road found that 10 per cent of its shippers gave freight traffic to the railway which brought in 70 per cent of the freight revenue, while the remaining 90 per cent of the shippers were the source of the traffic from which the remaining 30 per cent of freight revenues was secured. The 10 per cent of shippers are those whom the railways can and do approach by personal solicitation, say the advocates of freight advertising, but the 90 per cent, whose business may very well represent the difference between profit and loss to a railway, are those who seldom or never receive a call from a railway traffic department representative.

Only by advertising can this important bulk of railway shippers be reached. Since their business, like that of larger shippers, is constantly being solicited by railway competitors, the railways, say those who favor freight advertising, must get their sales story across to all of them, and this can be done, not merely by personal solicitation, but by a combination of personal solicitation and intelligent advertising.

Thus stands the argument at the present time, with neither side able to prove its case beyond a doubt because railway freight advertising has never been thoroughly tested. There have been a few examples of distinct freight-service advertising by railways, but not many. Except for a number of specialized campaigns in traffic publications and some use of direct-mail advertising, railway freight advertising has been rare rather than common.

Some Exceptional Campaigns

There have been a few notable exceptions, however, to prove the non-advertising rule. One outstanding freight campaign was that of the Pennsylvania which, several years ago, published a series of advertisements in national magazines and in newspapers on the occasion of the naming of 20 or more of its principal scheduled freight trains. As the first freight advertising campaign on such an elaborate scale, this one attracted wide attention and comment.

The Missouri Pacific, during the last 10 years, has experimented to some slight extent with freight advertising. A campaign partially devoted to advertising for freight business was started about two years ago in several national magazines of general character as well as in a number of recognized trade publications. Individual pieces of copy in the national campaign were reproduced locally also in newspapers along the line; for example, the magazine advertisement devoted to Kansas City, Mo., was reproduced in the Kansas City papers, in large space, together with a box in which the national publications where the advertising had appeared, were listed. Other freight advertising which the Missouri Pacific has tried has included a campaign which ran two years ago in Arkansas newspapers to promote the new storedoor collection and delivery service of the Missouri Pacific Transportation Company, and a special campaign which was launched during the latter part of last year in connection with an experimental live stock rate on the Belmont branch.

ON TIME
freight service
NOW AT YOUR DOOR

To the well-established advantages of modern terminal equipment, diversified rolling stock, speedy schedules, and ON TIME delivery, Chesapeake and Ohio now adds prompt motor-truck pick-up and delivery of l.c.l. freight. More reason than ever to use "the road that service built"—famous among shippers and receivers everywhere as the road you can bank on for ON TIME delivery.

CHESAPEAKE and OHIO

Advertising is Playing an Important Part in the Promotion of the New Collection and Delivery Service in the East

In addition, the Missouri Pacific has conducted two experiments in radio broadcast advertising, partly for the promotion of freight traffic. Although the series of broadcasts was largely designed to publicize the important cities and localities served by the Missouri Pacific, there were in addition specific programs devoted to the industrial, agricultural and natural resources of the states served by the railway, and from time to time programs concerned exclusively with the Missouri Pacific freight service were interpolated.

Launching the "Blue Streak"

Another notable example of railway freight advertising was the newspaper campaign with which the St. Louis Southwestern announced the inauguration of its "Blue Streak" freight train and co-ordinated train and truck service between St. Louis, Mo., Memphis, Tenn., Little Rock, Ark., Pine Bluff, Shreveport, La., and Texarkana, Ark. Describing the train as the "fastest freight train in America," the railway scheduled full-page advertisements, some of them in two colors, in one or more newspapers in Chicago, St. Louis, Shreveport, Little Rock, Pine Bluff, Texarkana and Memphis. In addition, advertisements ranging from 600 lines to 1,300 lines in size were published in newspapers in Cincinnati, Ohio; Cleveland; Detroit, Mich.; Evansville, Ind.; Indianapolis and Pittsburgh, Pa. This campaign, believed to have been the first in which full newspaper pages in two colors were used to acquaint the public with a single new train, was looked upon as a milestone in railway freight advertising.

Newspaper and magazine advertising has been used

to some extent by the New York, New Haven & Hartford to promote specific types of freight service, such as the "Maine Bullet" and "Speed Witch," high-speed freight trains, and the arrangements for fast handling of strawberries from the South to New England. Publication advertising has been supplemented in these cases

CAPITAL OF THE MID-SOUTH
And one of that section's greatest rail centers . . . A natural gateway for a large portion of the south and southwest...Pre-eminent as an inland cotton market, as a hardwood lumber market and as a producer of cotton seed products and mixed feeds . . . this is
MEMPHIS
A progressive city served by a fleet of Missouri Pacific freight and passenger trains that follow the routes of the Sunshine Special, The Texan and the Southern Scenic
SOUTH
Thru Arkansas and Louisiana to New Orleans and the Louisiana Coast.
SOUTHWEST
Thru Arkansas to Houston, San Antonio, Mexico and intermediate points.
WEST
To Little Rock, Dallas and Ft Worth and, thru the El Paso gateway to Arizona and Southern California.
NORTH
To St. Louis and, by convenient connection in St. Louis Union Station, the north and east.
NORTHWEST
Thru the White River Valley to Kansas City, Omaha and the Northwest, and thru Kansas, Colorado and Utah to the Pacific Coast.
Memphis
MISSOURI PACIFIC LINES
DEPENDABLE FREIGHT AND PASSENGER SERVICE
"A SERVICE INSTITUTION"
MISSOURI PACIFIC STAGES
AUXILIARY TO MISSOURI PACIFIC LINES

The Missouri Pacific Has Made Successful Use of a Series of Semi-Institutional Advertisements in Developing Freight Service

by circulars widely distributed, by lithographs displayed on the sides of New England Transportation Company trucks, and by counter cards and stickers for attaching to correspondence.

In addition to these few examples of specific freight advertising campaigns, many roads have engaged during recent years in institutional advertising by means of which a more or less direct effort has been made to promote freight business. Such was the determined and successful newspaper campaign which the Missouri-Kansas-Texas launched in the Southwest last year.

Freight Service Virtually Unadvertised in So-called "Consumer" Publications or Advertising Media

Despite the examples of railway freight advertising which could be cited, however, it is a generally admitted fact that railway freight service is virtually unadvertised so far as the so-called "consumer" publications or advertising media—newspapers, general magazines, radio, etc.—are concerned. Such advertising as has been done in these media has been, in nearly every instance, of a temporary or experimental character, and this fact in fairness needs to be taken into consideration in any examination of the results of freight advertising campaigns which the railways have tried.

In general, inquiry among the railways has failed to bring forth much tangible evidence of benefits to be derived from freight advertising. One of the reasons for this undoubtedly is that such advertising as the railways have done has been in a form largely institutional rather than specific in character and has been designed to secure results in the long run rather than immediately. On the other hand, there is a certain amount of evidence of the effect of advertising which is concerned with some new and definitely improved type of freight service. For example, the Cotton Belt's campaign in launching the "Blue Streak" is believed to have played an important part in the quick response of shippers to the establishment of the new train. While believing that the expenditure of much money for general freight advertising is not remunerative, the New Haven has found that advertising of special freight service, such as it has done in the case of the "Maine Bullet" and the "Speed Witch," is necessary and helpful.

The Missouri Pacific reports definite results from its national advertising and from the campaign which was run in connection with the establishment of the experimental live stock rate on its Belmont branch. The business on this branch has grown steadily since the announcement of the new rate and the beginning of the advertising campaign. The freight traffic department, well satisfied with the results, feels that little, if any, business would have resulted from the new rates and service if they had not been publicized by means of the advertising campaign.

Additional tangible evidence of benefits to be derived from advertising of new and improved freight service in newspapers and magazines may be in the making at this time. The eastern railways, which recently began to provide store-door collection and delivery service for l.c.l. freight, are supporting the solicitation efforts of their representatives with widespread advertising to promote the use of the new service. For instance, the Pennsylvania is now in the midst of an extensive advertising campaign on its new pick-up and delivery service in several magazines and in many newspapers along its lines—the outstanding current advertising campaign of its kind. The satisfactory initial results of the establishment of the new service are believed to be due, in part at least, to this extensive publicity campaign.

Service Improvements Handicapped Without Advertising

Should railway freight service be advertised? Advocates of railway freight advertising are convinced that by no other means can the fullest benefit be secured from the freight traffic development activities of the railways. The railways are effecting marked improvement in their

freight service by speeding up trains, by inaugurating collection and delivery service, by establishing new competitive rates and so on. But, it is contended, these improvements cannot be expected to attract the additional traffic which they deserve unless the shipping public is aware of their existence.

The fact cannot be ignored, say those who favor the use of advertising in the development of railway freight business, that advertising has an accepted and proven part in the modern selling methods of successful producers of goods and services. The railway business is not so exceptional that it will meet failure in the use of the sales methods which have worked consistently for other industries. The railways have less of a monopoly of transportation than the American Telephone and Telegraph Company and the various public utilities like electric and gas companies have in their fields, yet these companies have long and successfully used advertising to increase their business. If advertising pays these companies, as it does, it will pay the railways.

Freight advertising, say its advocates, cannot take the place of personal solicitation but it can reach shippers who never see a traffic solicitor, and it can increase the efficiency of traffic solicitors and make it easier for them, in calling upon large shippers, to obtain more traffic with less effort. It is in supporting traffic solicitors and in making the general shipping public aware of the better rail service now available that advertising upon a broad scale is believed to have a place of its own in the freight traffic development activities of the railways.

* * *

Jefferson Canyon, Mont.—Northern Pacific in Foreground; Chicago, Milwaukee, St. Paul & Pacific Across the River

In the Issue of March 3

Traffic recovery and new traffic development are the primary needs of the railways, to stop and reverse the trend of ebbing revenues. Can railway passenger and freight traffic be increased despite competition already strong and constantly growing stronger? If so, how can this be brought about? The next and final article in the Traffic Development Series will review the suggestions and conclusions of the other articles in the series, under the title, "Competition Can Be Overcome!"

Motor Trucking Code Effective February 25

WASHINGTON, D. C.

THE Code of Fair Competition for the Trucking Industry, which has now been signed by President Roosevelt, becomes effective on February 25 when the administration of its provisions will be assumed temporarily by a National Code Authority of nine voting members—seven to be chosen by the Board of trustees of American Trucking Associations, Inc., and two to be selected in a manner approved by Administrator Johnson of the N. R. A. This temporary organization will subsequently be supplanted by an elaborate setup of national, regional, state and divisional authorities selected in accordance with the code's provisions.

Exempt from the code's provisions are vehicles used principally for the transportation of used household goods and used office furniture and equipment; vehicles not operated for hire except to the extent that such transportation is subject to another N. R. A. code; farmer-owned vehicles transporting produce from farms to markets and such vehicles when transporting for neighbors on a reciprocity basis; and, with certain stipulations, the trucking operations of bona fide farmers' cooperative associations. The moving vans, however, are exempt only pending a public hearing to be held prior to June 15, after which hearing "the Administrator shall make a determination in respect to the modification or extension in whole or in part of such exemption." Meanwhile household goods carriers claiming exemption are required to register with the code authority of the household goods storage and moving trade. Jurisdictional disputes with related industries are to be adjusted by a board of review representing the industries involved with final decision on any controversy left with the Administrator.

Hours of Work and Wage Provisions

The hours and wages provisions are calculated to fix the maximum for the former and the minimum for the latter and nothing in the wage provision is to be approved which "tends to set a maximum as well as a minimum." Clerical and office employees are limited to a six-day week of 40 hr., with a minimum weekly wage of $14 in places of less than 250,000 population and $15 in cities of more than 500,000 population. Drivers and helpers are not permitted to work more than 108 hr. in any consecutive two-week period, nor more than 192 hr. in any consecutive four-week period, nor more than 12 days in any 14-day period. Except in cases covered by an emergency provision these employees assigned to trucks will be paid at 1⅓ times their regular hourly wage rate for all time worked in excess of 48 hr. in any one week. The emergency provision in this connection is designed to meet seasonal demands for transport when drivers will be permitted to work an additional 12 hr. beyond the 108-hr. minimum in any two-week period.

All time spent by an employee on or in any vehicle shall be considered time worked "unless such employee is a relief employee off duty engaged on a vehicle equipped with a sleeping compartment." Subsequent provisions defining "off duty" and "deadheading" are to be submitted in 90 days. Minimum wages of drivers and skilled labor are graduated in accordance with sections of the country and the population of cities; they range from 30 cents per hr. in places of less than 15,000

population in the South to 55 cents per hr. in Northern cities of 2,000,000 or more population.

Employees, other than drivers and office workers, are not permitted to work in excess of 48 hr. per week averaged over a three-week period, nor more than 54 hr. in any one week, nor more than 12 days of any 14-day period. They are to receive 1⅓ times their normal rate of pay for all hours worked in excess of eight per day or 48 per week and the minimum rates in this classification range from 25 to 40 cents per hour. Maximum hours do not apply to employees engaged in an executive or managerial capacity, i.e., those in the North receiving $35 per week and those in the South receiving $30. Neither do they apply to watchmen who are permitted to work 56 hr. but not more than six days in any seven-day period.

Under another provision employees are given the usual N. R. A. right to organize and bargain collectively through representatives of their own choosing.

Under Article VII—Rates and Tariffs, the code requires that all operators must file, with appropriate State or Regional code authorities, schedules of minimum rates which must be adhered to until altered schedules are filed.

Rates must be sufficient to cover all costs of service except "such lesser rates as may be approved by the appropriate code authority permitting such for hire member to meet the rates and tariffs of a competitor outside the industry."

The elaborate set-up for the administration of the code evolves from the divisional code authorities into a national organization and the latter has final jurisdiction. Divisional code authorities may cover either a natural division of the trucking industry or an area division of a state. If organization of such a divisional authority be decided upon it shall have four voting members elected by truck operators—two on the basis of votes cast by registered members voting as firms and two on the basis of registered members voting on the basis of vehicles registered under the code.

State code authorities have primary jurisdiction within a State or other area assigned by the National Code Authority. The four voting members of State authorities are elected in the same manner as are voting members of divisional authorities.

Regional code authorities are given jurisdiction over interstate matters and concurrent jurisdiction with other regional code authorities on inter-regional matters. These regional authorities, composed of one member from each State involved, are chosen by the State code authorities.

The National Code Authority is charged with the general administration of the code and, among other specific powers granted to it, it is given authority "to function through such trade associations and other agencies as it deems proper and through the Regional, State and Divisional Code authorities . . . and provided that such subordinate code authorities, trade associations and agencies shall at all times, be subject to and comply with the rules, regulations and restrictions laid down for them by the National Code Authority and the provisions of this code and of the Act." Voting members of the National Code Authority, succeeding those temporarily appointed at the outset, will be elected by members of regional code authorities.

The code requires that within 30 days after its effective date or within 10 days after their entering the trucking business all operators must register with the appropriate authority. Concluding articles list trade practice rules among which are those designed to eliminate rebating in all its forms.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 3 amounted to 564,098 cars, an increase of 2,532 cars as compared with the week before and of 78,039 cars as compared with the corresponding week of last year, but a decrease of 9,825 cars as compared with 1932. Loading of merchandise, coal, and coke showed increases as compared with the week before and all commodity classifications except live stock showed increases as compared with last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week ended Saturday, February 3, 1934

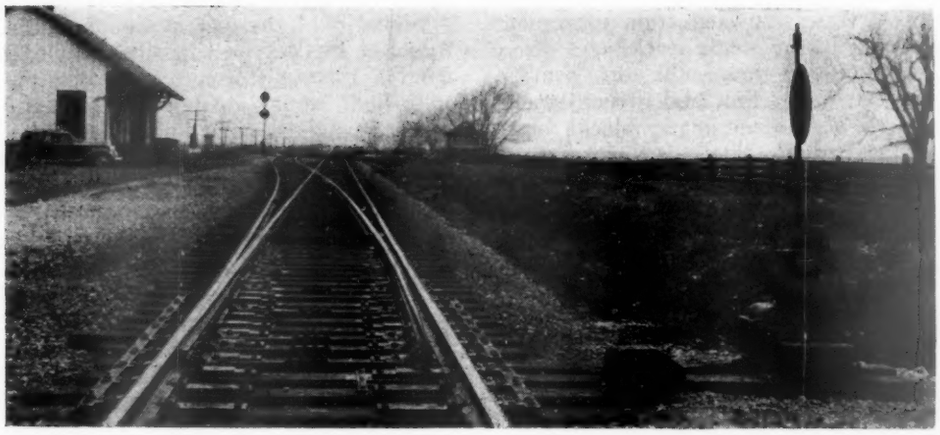
Districts	1934	1933	1932
Eastern	130,954	114,792	132,479
Allegheny	108,116	91,674	111,928
Pocahontas	39,904	34,172	36,938
Southern	89,101	77,522	88,275
Northwestern	66,327	53,367	66,921
Central Western	81,608	71,628	88,447
Southwestern	48,088	42,904	48,935
Total Western Districts	196,023	167,899	204,303
Total All Roads	564,098	486,059	573,923
Commodities			
Grain and Grain Products	31,360	25,524	31,424
Live Stock	15,625	16,037	20,072
Coal	133,600	107,382	128,630
Coke	8,962	5,619	7,108
Forest Products	20,173	14,450	18,333
Ore	2,471	1,420	1,971
Mdse. L. C. L.	162,237	161,962	187,543
Miscellaneous	189,670	153,665	178,842
February 3	564,098	486,059	573,923
January 27	561,566	475,292	560,343
January 20	560,430	499,554	562,101
January 13	555 627	509,893	572,649
January 6	499,939	439,469	571,678
Cumulative total, 5 weeks	2,741,660	2,410,267	2,840,694

The freight car surplus for the first half of January averaged 435,819 cars, a decrease of 26,744 cars as compared with the last part of December. The total included 256,100 box cars, 122,110 coal cars, 25,561 stock cars, and 12,438 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended February 3 totaled to 39,543 cars, according to the Dominion Bureau of Statistics. This was a decrease from the previous week of 628 cars which reduced the index number from 72.33 to 69.31. Compared with last year, the total represented an increase of 7,632 cars and this was the eighteenth consecutive week to show an increase over the corresponding week of a year previous. Loadings of every commodity showed an increase over last year, miscellaneous freight continuing in the lead with a gain of 1,766 cars, grain was up by 882 cars, merchandise by 1,041 cars, pulpwood by 816 cars and lumber by 656 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
Feb. 3, 1934	39,543	20,660
Jan. 27, 1934	40,171	21,149
Jan. 20, 1934	40,775	20,463
Feb. 4, 1933	31,911	17,080
Cumulative Totals for Canada:		
Feb. 3, 1934	196,240	102,078
Feb. 4, 1933	155,706	84,560
Feb. 6, 1932	200,827	100,696



The Switches Equipped With Spring Mechanisms Are Well Braced

Centralized Traffic Control Replaces Staff System on G. T. W.

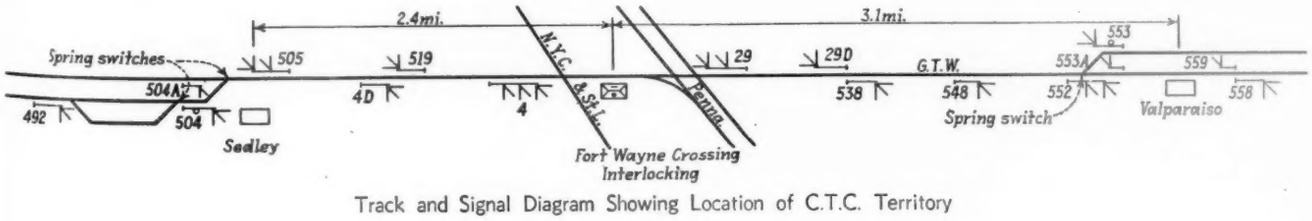
Train movements directed by signal indications—Spring switches used to eliminate mechanical interlocking—Project cost $5,000 and saves $6,000 annually

CENTRALIZED traffic control, together with spring switches, has been installed by the Grand Trunk Western to replace an interlocking and a staff system on a 5¼-mile section of single track between two ends of double track at Sedley, Ind. and Valparaiso. When second track was built on other parts of this division in 1902, construction on this section was postponed indefinitely on account of the large expenditure required to reduce the curves and grades. In order to protect train movements over the single track, a staff system was installed and a four-lever mechanical interlocking was built at Sedley to handle the end-of-double-track switch and a passing-track switch. Operation of this plant required three men, 24 hour service being maintained. The end-of-double-track switch at Valparaiso was hand-thrown, being handled by the operators on duty at that point.

In operating trains with staff system, using an absolute block, permissive following movements could not be made. Furthermore, considerable time was lost at each end of the single track in handling the staff. In order to reduce delays and increase the capacity of this single track by permitting following moves under signal protection, it was decided to replace the staff system with centralized traffic control, whereby signals at each end of the double track would be used for directing train movements, the signals to be controlled by a machine in the operator's office at Valparaiso. As a part of the improvements, spring switches were installed for the passing track and end-of-double-track switches at Sedley, thus permitting the abandonment of the mechanical interlocking and block office at that point. In order to eliminate delays occasioned by the operator handling the end-of-double-track switch located at Valparaiso, a spring switch was installed at that location also.

Signaling Layout

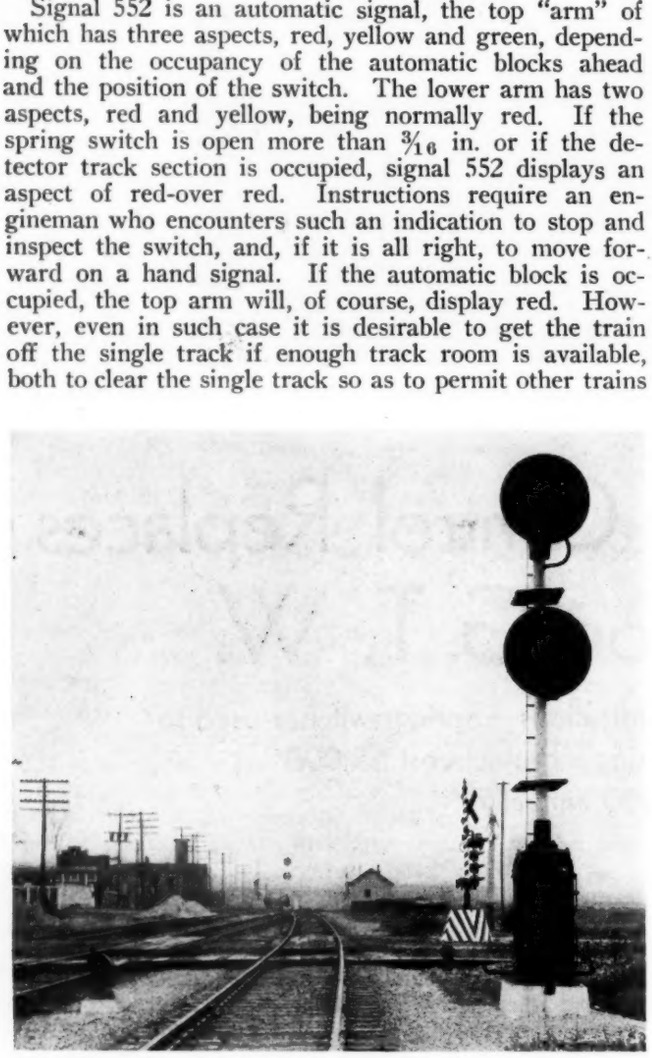
At Valparaiso, signal 553, a two-"arm" color-light signal, controls train movements from the westward main track to the single track. The top "arm" displays one of three aspects, red, yellow or green. The bottom arm is a fixed red light. This signal operates as a color-light, semi-automatic interlocking home signal, the yellow-over-red indication giving authority for a second train to make a permissive movement into the occupied block. The automatic features in the control of this aspect are such that it will not be displayed until the preceding train has passed beyond the eastward home signal at Ft. Wayne Crossing interlocking. Signal 553A, a two-position searchlight dwarf, display-



Track and Signal Diagram Showing Location of C.T.C. Territory

ing red or yellow, directs westward train movements from the eastward track to the single track.

Signal 552 is an automatic signal, the top "arm" of which has three aspects, red, yellow and green, depending on the occupancy of the automatic blocks ahead and the position of the switch. The lower arm has two aspects, red and yellow, being normally red. If the spring switch is open more than 3/16 in. or if the detector track section is occupied, signal 552 displays an aspect of red-over red. Instructions require an engineman who encounters such an indication to stop and inspect the switch, and, if it is all right, to move forward on a hand signal. If the automatic block is occupied, the top arm will, of course, display red. However, even in such case it is desirable to get the train off the single track if enough track room is available, both to clear the single track so as to permit other trains



Signal 553 With Single-Unit Lower Arm

to move, and also, to prevent a train from stopping on the ascending grade.

In order to meet these conditions a "call-on" aspect was provided. The low arm is controlled only through the switch circuit controller at the spring switch and through the detector track circuit extending between signals 552 and 553-533A. Therefore, if the spring switch is closed and the detector track section is unoccupied, the low arm displays yellow. In this case, if the automatic block is occupied, signal 552 displays an aspect of red-over-yellow, a "call-on" aspect which informs an engineman that the switch is in position but that the block is occupied. This gives him authority to pass the signal without stopping, but to run at slow speed prepared to stop short of a train or obstruction.

At Sedley, signal 504 is equipped and controlled in the same manner as signal 553. Signal 504A is similar in operation and control to signal 553A. A telephone booth, at signal 504 contains a dispatcher's telephone and also a short-line telephone connecting it with the tower at Ft. Wayne Crossing and with the operator's office at Valparaiso. A train occupying the passing track must get permission from the operator at Valparaiso, in addition to a permissive indication from signal 504, before moving onto the main line.

Signal 29D, the distant signal for the westward home signal at Ft. Wayne Crossing interlocking, was changed from a three-position semaphore to a three-position color-light signal. Automatic signals 538 and 548 are newly installed color-light signals. Signal 4D, the distant signal for the eastward home signal at Ft. Wayne Crossing, was also changed from a semaphore to a three-position color-light and relocated 5,500 ft. from the home signal. Automatic signal 519 is a newly installed color-light signal. These signals are Union Type-TR.

The Control Machine

The control machine in the station at Valparaiso consists of two General Railway Signal Company interlocked desk levers with a large illuminated track-and-signal diagram. Leftward operation of levers controls eastward movements and a rightward operation controls westward movements. To clear signal 553 for a westward train movement from Valparaiso to Sedley, lever No. 1 is thrown to the right and lever No. 2 remains normal. To clear dwarf signal 553A for a westward train movement from the reverse main at Valparaiso to the single track, both levers are thrown to the right. When it is desired to give a permissive signal for a following train to enter the occupied block, the levers having been operated as explained, the operator pushes the push-button at the right-hand side of lever No. 1. The control of signals direction eastbound train movements is similar to that explained above excepting that the lever operation is different.

The illuminated track-and-signal diagram mounted above the levers reproduces the entire track layout and the location of the signals. Lights indicate the occupancy of the different track sections and repeat the signal indications. Two special lamps repeat the position of the two spring switches, being lighted when the corresponding spring switches are not closed to within 3/16 in. If a line-up is to be changed, the clockwork time release, which is set at two minutes, must be operated.

The Spring-Switch Layouts

As a part of the installation of the spring switches, the switch layouts were entirely rebuilt. The two turnouts on the main line are No. 20, with switch points 33 ft. long, reinforced full length with one-inch straps and held in place by body-bound bolts. Adjustable rail braces are used on 10 ties, including the one ahead of the point. The spring-switch stands are the Ramapo Ajax Company's Racor Type 100A, and are equipped with Union Switch & Signal Company oil buffers. This spring-switch machine has two sets of springs which are arranged so that each spring tends to rotate the shaft to the normal position, i. e., with the switch-point closed. When the switch is trailed through, both sets of springs are working against pressure, but the action is retarded by the oil buffer. A by-pass is provided so that the buffer is released when the point is about one inch from the closed position, causing the points to be snapped over under full spring pressure for this final distance, thus closing the switch with a bang, which springs the point up snugly in place. When the hand-throw lever of the switch stand is lifted to throw the switch, the shaft is disengaged from the spring mechanism, so that the switch can be thrown without working against spring pressure. The spring-switch mechanism is considered as a signaling device and is maintained by the signal maintainer.

The installation of centralized control, including spring switches, has been in service since September 12,

1933, and the operating department is well pleased with the benefits in reducing train delays. When the staff system was in service, any eastward freight train running on short time ahead of a passenger train, would be held at Sedley until the passenger train reached Valparaiso. With the c.t.c. system, the freight can be run ahead of the passenger train saving from 15 to 30 min. time.

Both Sedley and Valparaiso are at higher elevations than Ft. Wayne Crossing, a heavy grade ascending from a point approximately one mile west of the crossing to the station at Valparaiso, resulting in slow speeds particularly for eastward trains. The operator at Valparaiso keeps in communication with the leverman at Ft. Wayne crossing when a heavy eastward freight train is approaching Sedley, and unless the leverman at the crossing knows that he can line up the route for the Grand Trunk train, the operator holds the train at Sedley until a through route can be lined up. The purpose of this is to permit the Grand Trunk train to run down the grade from Sedley to the crossing and up the grade to Valparaiso without having to stop in the sag. With the new c.t.c. facilities, as soon as an eastward train clears the eastward home signal at Ft. Wayne Crossing interlocking, the operator at Valparaiso can give a permissive aspect on signal 504 to let a second eastward train enter this block. This feature of the new signaling is aiding materially in reducing delays to freight trains.

The signal installation required an expenditure of approximately $5,000 and the payroll saving in operating expenses, occasioned by the elimination of the interlocking at Sedley, is about $6,000 annually. The installation was designed and installed by signal department forces under the direction of W. L. Dayton, superintendent of signals.

A Machine for Cleaning Tank Cars

An automatic, mechanical, tank-car washing machine, designed and built by the Pyrate Corporation, Portland, Ore., has been thoroughly tested during the past 12 months by the Union Pacific at Los Angeles, Cal., and the General American Tank Car Corporation at Chicago. The machine is used to apply chemicals to tank-car interiors automatically and mechanically, providing cleaner cars at substantially less cost than by present hand-cleaning methods. It is estimated that the Pyrate system saves approximately 50 per cent in labor and material costs, also reducing by a similar amount the time which cars must be held out of service for the cleaning operation.

The Pyrate process involves the cleaning of all kinds of tank-car loadings in the edible and inedible oil and grease class, fuel and lubricating oils in the petroleum class, and various kinds of chemical loadings. The mechanical cleaning machine is said to do unusually effective work, enabling changes in car service to be made from one commodity to another without contamination of the lading. Another important advantage is the elimination, in most instances, of the necessity of steaming the cars before cleaning. Labor conditions in the repair yards and cleaning tracks also are improved, since it is easier to clean tank cars, and, owing to the more thorough cleaning of the cars, men using cutting or welding torches on repair work can operate with less discomfort and danger from smoke and gases.

The illustrations show Pyrate tank-car cleaning machines installed on a double-track cleaning rack at the East Chicago plant of the General American Tank Car Corporation. While two machines are included in this

Cleaning Machine Inserted in the Tank with False Dome Cover Secured in Place and the Machine Ready for Operation

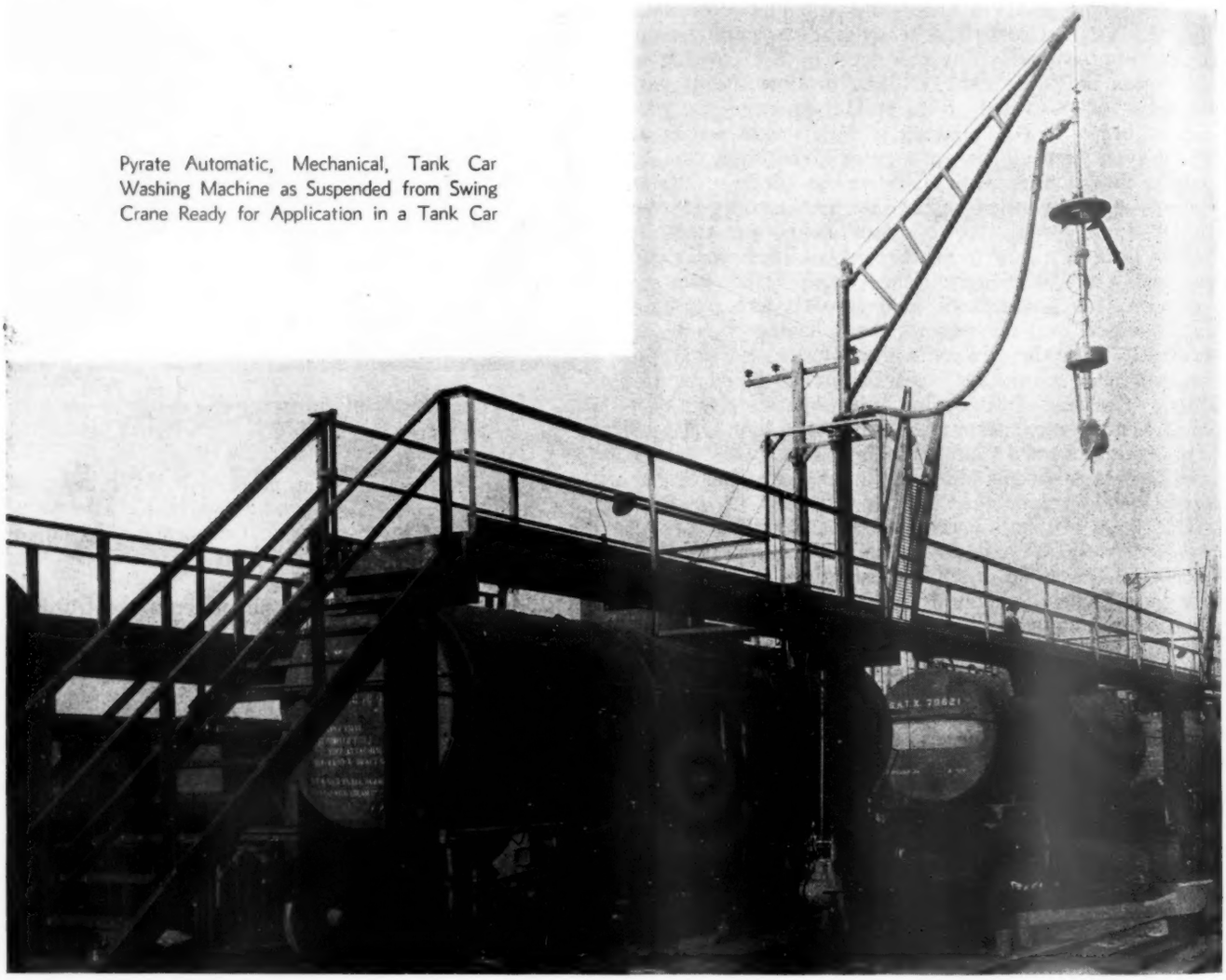
set-up, it is anticipated that more will be installed at such a time as production demands warrant. These machines are leased by the Pyrate Corporation, which, in turn, supplies the chemicals required in the cleaning operation.

The Pyrate machine is made almost entirely of bronze and brass to eliminate the possibility of ignition by sparking, should the machine accidentally bump against the inside of a car containing inflammable gases. Special attention has been given to wearing parts, stainless steel being used wherever possible. As may be seen from the illustrations, the machine comprises essentially a pipe assembly extending through a false dome cover and provided with a 3-inch flexible wire-wound hose connection at the top to supply the cleaning chemical under pressure, a standard steam hose connection at the dome cover for use when it is necessary to steam the cars, a series of four stationary nozzles just below the false cover used in cleaning the dome and a pair of rotating nozzles at the lower end of the pipe for cleaning the interior of the main tank. These lower nozzles revolve slowly in a vertical plane and also in a horizontal plane under gear drive from a small turbine, thus cleaning effectively all interior parts of the tank.

The machine is supported by a counterweight from a swing crane over the cars, thus permitting its ready application to, or removal from, the tank-car dome. The dome cover is clamped in place by means of wing nuts and adjustable clamps. An adjustment feature permits lowering the revolving nozzles to the proper position near the center line of the tank, regardless of the tank's size. The dome cover also is designed to fit all standard sizes of dome openings. All projecting parts of the machine are well guarded against any damage which might occur in handling.

During the actual cleaning operation, the prepared chemical solution, contained in tanks below the ground, is forced, by means of a steam pump, through pipes into the machine and out of the rotating nozzles in two concentrated streams under 150 lb. pressure. At this pressure and with the nozzle size and design provided, the two streams of a chemical solution can be thrown, in practically a straight line, a distance of over 60 ft.

The nozzles revolve in a vertical plane, step by step, a degree at a time and the entire nozzle support and gear-drive assembly revolves about a vertical axis at a speed which is automatically varied so that twice as much time is allowed for cleaning the ends of the car as is used in cleaning the sides. Two underground storage tanks of 1,000-gal. capacity each are used for the chemicals, one for the cleaning of petroleum service cars and the other for edible and inedible commodity cars.



Pyrate Automatic, Mechanical, Tank Car Washing Machine as Suspended from Swing Crane Ready for Application in a Tank Car

In practically all 10,000- and 12,000-gal. tank cars, no vertical adjustment of the machine is necessary in the cleaning operation, as the nozzles work at any point desirable between the top and bottom sheets. However, in some 6,000- and 8,000-gal. tanks, which are lower and longer, the angle at which the stream strikes some of the sheets in the car is quite small. To increase this angle of action to a sharper or more direct hit, the machine, while working, is raised and lowered by turning a wheel which revolves on a quadruple thread. Half the cleaning operation can then be performed with the machine near the top of the car and the remaining half with it located near the bottom. This enables the two streams of cleaning solution to strike the tank sheets more directly and effectively.

The machine is said to perform the following duties: Apply heat at a constant temperature; apply a scrubbing force for cleaning with a chemical especially prepared to attack the substance to be cleaned and still allow it to be rinsed free. After the mechanical cleaning operation is completed, the car is cooled by the machine in about 15 minutes so that a man may enter the dome, to brush out any remaining sludge and water which does not drain out.

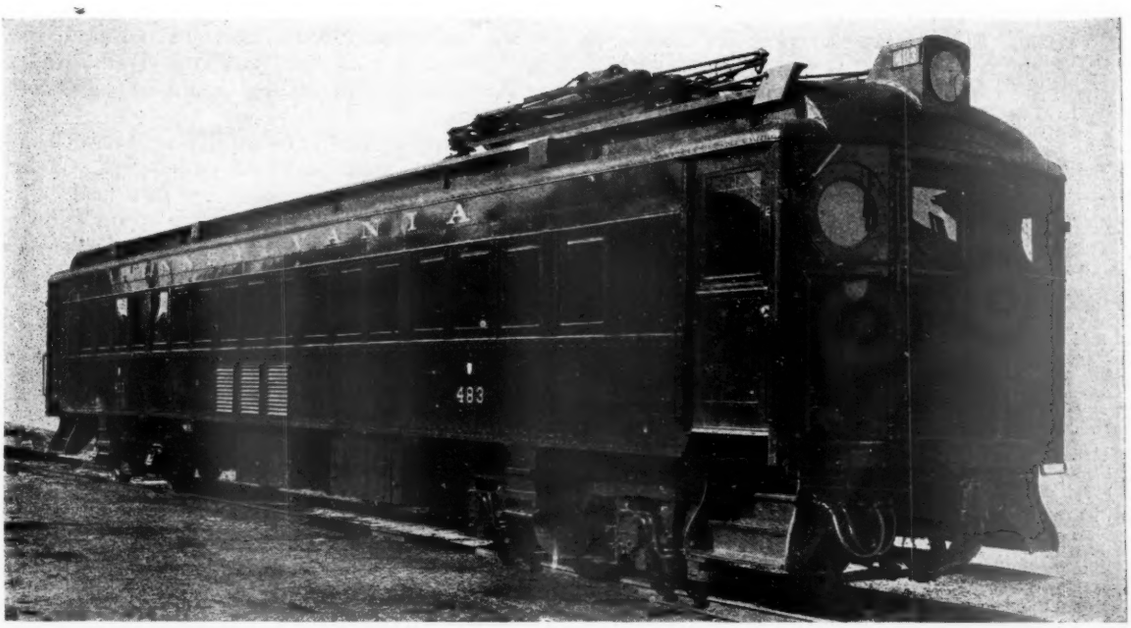
The alkaline chemicals furnished by the Pyrate Products Corporation and used in the cleaning operations are the result of several years' experiment with all types of car cleaning. For deodorizing tank cars previously loaded with such products as petroleum, fish oil, etc., this company has developed a new product known as Pyrasol, a stable form of chlorine, which performs the double function of cleaning and deodorizing. Pyrasol, which comes in crystalline form, previous to solution, has also been used for cleaning and deodorizing refrigerator cars.

FIVE CARS OF GASOLINE and four box cars were burned at the Proviso (Chicago) yard of the Chicago & North Western on February 5 when gasoline in one of the tank cars ignited and fire spread to the other cars. The gasoline became ignited as the cars were being switched.

THE PORT OF NEW YORK AUTHORITY has recently issued a revised railroad terminal map of New York harbor for the information and guidance of traffic managers, shippers and others who use the freight-handling facilities of that port. The map shows all waterfront terminals, classification yards, freight and passenger stations, carload and l.c.l. delivery points, float bridges, lighterage limits, ferry lines, etc.

Motor Cars and Trailers for the Pennsylvania Electrification

Old and new cars may be operated together— Electrical parts reduced almost half by motor-trailer combination



One of the Motor Cars Having 426-626 Equipments. These Cars are Distinguished by the Air Louvres in the Side.

By R. H. STOBERG
General Electric Company

and CHARLES KERR, JR.
Westinghouse Electric & Manufacturing Company

THE electrification of the Pennsylvania Railroad serves one of the most densely populated suburban territories in America with frequent, high-speed transportation by means of multiple unit trains. This electrified suburban service which was initiated in 1915 constitutes one of the major aspects of the electrification, and is provided by 386 multiple unit cars. The present comprehensive program further extends this service, thus requiring additional multiple unit cars.

Prior to the inauguration of the main line electrification, the railroad and the electrical manufacturers commenced a most extensive development program, from which resulted an a. c. locomotive with a weight efficiency and concentration of power heretofore believed unattainable. A similar program for multiple-unit car equipments has produced similar results, and has culminated in the design of the latest type of suburban equipment for the Pennsylvania Railroad.

Selection of Equipment

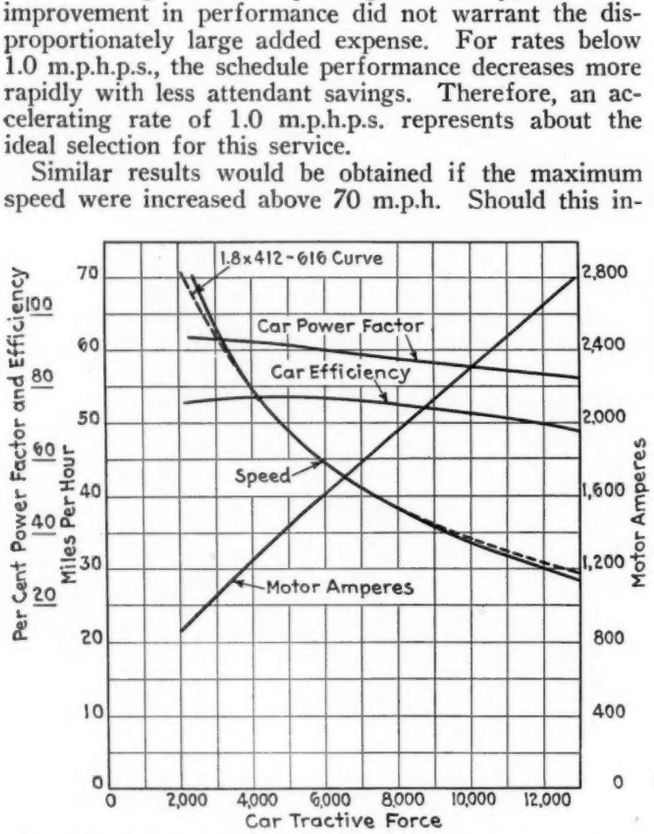
Recent progress in motor design has made greater horsepower available and permitted considerable choice in method of operation. Therefore, before deciding upon an equipment for the new cars, 41 of which are now in service, a thorough study was made to determine the most economical unit that could be built. The Pennsylvania suburban service represents an average distance between stops of 1.45 miles, with runs varying from 1.0 to over 10.0 miles in distance. As a first consideration the selected equipment required sufficient motor capacity for the most severe service represented by the lines having the shortest length runs of one mile. The density of traffic was such that it was economical to operate trains of two cars or more. It was also very desirable that the new equipment be able to operate as multiple units with the existing equipments. The early equipments have an accelerating rate of approximately 1.0 m.p.h.p.s. and a maximum speed of 65 m.p.h.

A. C. equipment was available which could give practically any accelerating rate and maximum speed desired. A study was made to select the economical and desirable limits of operation for future multiple-unit cars, irrespective of past practice. This study demonstrated very clearly that the best combination was obtained with car equipments having an accelerating rate of 1.0 m.p.h.p.s. and a maximum speed of 70 m.p.h. Incidentally, this gave approximately the same accelerations and speeds as are employed in the earlier cars, making

it possible to use both types of cars in a single train without sacrifice in performance.

Rates of acceleration exceeding 1.0 m.p.h.p.s. are only advantageous on exceptionally short runs. To have increased this rate to 1.50 m.p.h.p.s. would have required an increase in motor capacity in Pennsylvania service of 30 per cent, an increase in power consumption of 4.7 per cent, and an increase in equipment cost of 23 per cent. It would have resulted in an improvement in speed of only 3.3 per cent, or about 30-45 seconds saving in the average ride of a passenger. Clearly, this small improvement in performance did not warrant the disproportionately large added expense. For rates below 1.0 m.p.h.p.s., the schedule performance decreases more rapidly with less attendant savings. Therefore, an accelerating rate of 1.0 m.p.h.p.s. represents about the ideal selection for this service.

Similar results would be obtained if the maximum speed were increased above 70 m.p.h. Should this increase have been to 90 m.p.h., a 28 per cent increase in capacity would have been required and a 21 per cent increase in equipment cost with an increase of 9.1 per cent in power consumption. The improvement in average service would have been the same as with the 50 per cent increase in accelerating rate. The advantages of the higher speed are pronounced only on runs exceeding 5 miles in length, and as these constitute less than 6 per cent of the total, the increased speeds do not warrant the added cost necessary to obtain them.



Motor Car Performance Curve on 11,000 Volts Trolley, Including Auxiliaries and All Losses From Trolley to Rail

The above study furthermore clearly demonstrated that the most economical equipment was a two-car unit semi-permanently coupled. Motor car and trailer operation, admittedly slightly less flexible from the standpoint of train make-up when compared with all-motor car operation, results in considerable reduction in first cost, operating expense and weight. Traction motors capable of handling twice the number of cars could be placed in the same space occupied by the earlier motors. On the basis of the present type of cars this required a continuous capacity of 740 horsepower, representing an increase of 80 per cent. This was obtained with minor truck changes. By properly locating the equipment to provide the maximum weight on the driving axle, the necessary starting effort was obtained without exceeding established practices in regard to adhesion rates. It can be seen from a comparison of weights that this new equipment resulted in a weight saving of 36,000 lb. in each two-car unit.

The speed characteristics of the alternating current commutator motor are ideal for this type of service; due to their steep shape, smooth acceleration can be obtained with the minimum of accelerating steps. Also, after reaching the top speed curve rapid acceleration is obtained up to the maximum speed.

Motor Cars and Trailer Cars

Previous to 1915, the Pennsylvania Railroad designed a class MP-54 car for suburban service. Having in mind eventual electrification, this class of car was built for conversion to electric operation when required. Hence when additional electric cars are required, the existing MP-54 cars are taken to the Pennsylvania Railroad shops at Altoona, overhauled and equipped with motive power apparatus.

The class MP-54 is 64 ft. 0½ in. between inside faces of knuckles, and seats 72 passengers. When placed in electric service the cars are equipped with electro-pneumatic brakes and a certain proportion with cab signals. The approximate weights of the new motor-trailer and of the single motor cars when equipped for electric operation are as follows:

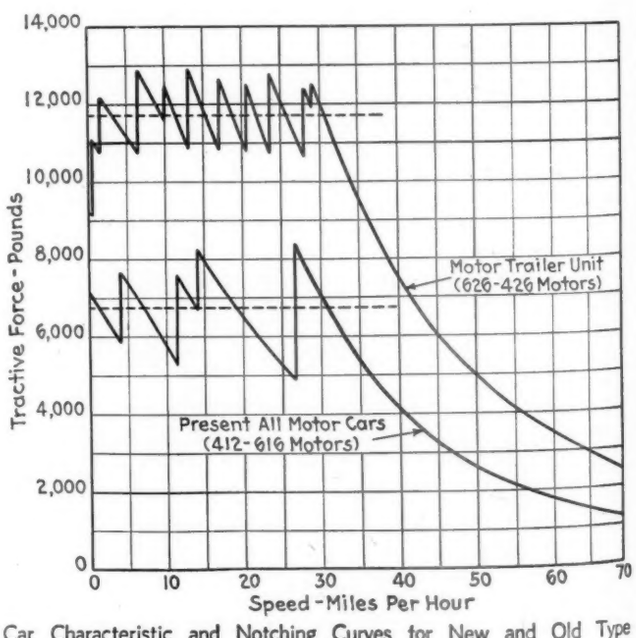
	Single Motor Cars	New Motor-Trailer Cars
Motor Car complete	130,000 lb.	127,000 lb.
Trailer Car complete	.....	91,000 lb.
Weight two cars	260,000 lb.	218,000 lb.

The remarkable improvement made in the weight efficiency of the electrical equipment is illustrated in the table of equipment weights.

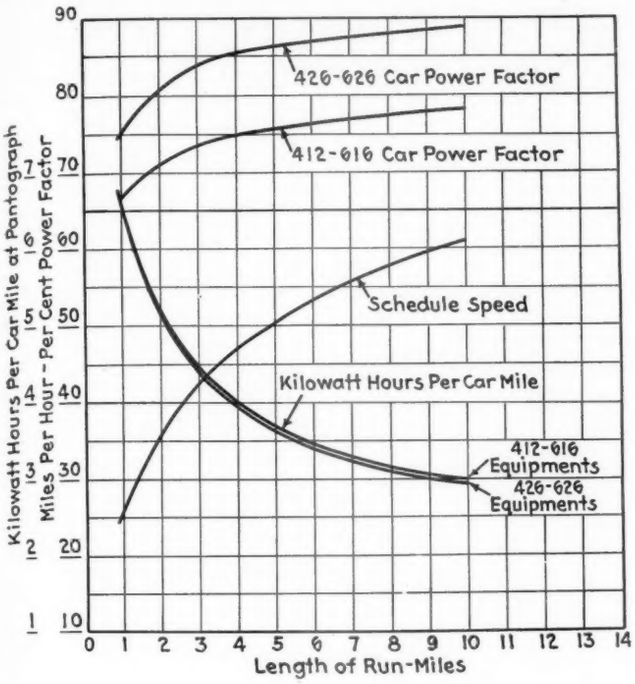
These reductions in weight merit more than passing notice. They have provided a high voltage a.c. equipment for operation from an 11,000-volt, single-phase, 25-cycle trolley with a weight per horsepower equal to or better than that of any multiple-unit equipment now operating in this country.

Car Equipment

The apparatus for the motor cars is of joint design by the Westinghouse Electric & Manufacturing Company and the General Electric Company. All corresponding parts were built to the same drawings and are

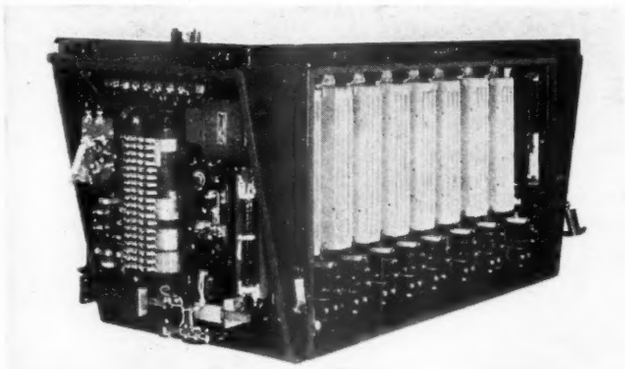


Car Characteristic and Notching Curves for New and Old Type Motor Cars


426-626 Car Power Factor
412-616 Car Power Factor
Schedule Speed
Kilowatt Hours Per Car Mile
412-616 Equipments
426-626 Equipments
Kilowatt Hours Per Car Mile at Pantograph
Miles Per Hour - Per Cent Power Factor
Length of Run-Miles

Operating Characteristics of an Eight-Car Multiple Unit Train—Davis Friction—Level Profile—Average Duration of Stop 20 Seconds —Acceleration, 1.0 M.P.H.P.S.—Braking, 1.5 M.P.H.P.S.

interchangeable, irrespective of manufacturer. In designing the equipment, especially the control apparatus, particular efforts were made to include parts which



Main Control Box

were already in use on the locomotives, thus reducing to a minimum the number of spare parts carried by the railroad.

Each two-car unit is powered with two single-phase, 25-cycle, commutator motors having the rating shown in the table.

Traction Motors

Type	General Electric 626—Westinghouse 426
Cont. H. P. at shaft (120° rise by resistance)	370
Amperes continuous	1,560
Motor volts	220
Revolutions per minute	1,100
Number of poles	12
Forced ventilated	2,400 cu. ft. of air per minute
Gear ratio	57:22
Wheel diameter	36 in. new—35 worn
Maximum speed—Worn wheels	70 m.p.h.

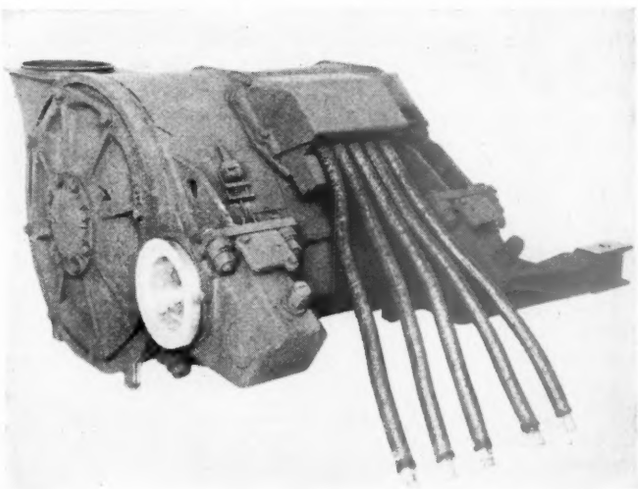
The required increase of 80 per cent in motive power has been made possible through radical improvements in the design and manufacture of single-phase motors thus permitting a large increase in the horsepower rating and in the commutating capacity which could be built into the available space. The motor weight, without gears, is 5800 lb. or 15.7 lb. per continuous horsepower.

The increased continuous horsepower capacity has been obtained principally by doubling the amount of cooling air supplied to the traction motors and by the use of higher motor armature speeds for a given car speed. In order to utilize the available horsepower capacity the commutating capacity was correspondingly increased by the use of 12 brushholders, weakened torque field at starting, interpoles with high and low speed settings, and by additional improved equalization of the armature windings. The total number of brushes and brushholders as well as the quantity of the ventilating air is no greater than that required on two of the earlier cars, which are replaced by one of the new two-car units.

The design and manufacture also incorporate closer tolerances, the use of armature roller bearings, improved commutator and brushholder construction, and spinning and seasoning of commutators after manufacture, all resulting in better brush and commutator life. The frames are of fabricated rolled steel. The axle caps are of the auxiliary reservoir type and provide uniform lubrication.

The 25-cycle power vibration and noise have been practically eliminated by the use of a specially designed motor nose support consisting of a nest of coil springs between the motor nose and the transom, effective in both upward and downward movements, together with the use of a flexible gear. This has resulted in quiet operation during accelerations in spite of the high torque developed.

The pantographs are of the conventional spring-raised, air-lowered type supported by eight insulators. They



One of the Single Phase—25 Cycle—Commutator Motors. Continuous Horse Power at Shaft 370

Equipment Weights

Apparatus	Weights in Pounds Earlier Cars	New Cars
Motors (two)	12,750	11,600
Gears & gear cases	1,812	2,026
Transformers	6,660	6,100
Preventive coils	436	430
Main field shunts	...	450
Interpole shunts	...	608
Reactor	225	...
Pantograph	1,134	1,294
Blower generator	1,002	1,290
Switch group	1,800	1,795
Other control	732	824
Total motor car	26,551	26,382
Total weight trailer car	...	376
Horse power per motor car	400	740
Weight per continuous hp. (Motor Car only)	66.4	35.7
Weight per continuous hp. including trailer car equipment	...	36.1

are designed for a variation in contact line height of 15 ft. 3-in., to 25 ft. 10¼-in., one pantograph being used on each two-car unit. A relay prevents lowering the pantograph in case of high fault currents in the high tension circuits. After the fault is cleared by the substation breakers the pantograph is automatically lowered.

The transformers, preventive coils and main field shunts are of the air blast type. The main transformers have Bakelized windings with all main taps brought out on one end, thus simplifying the wiring under the car, As is customary on all a.c. cars, the transformer is suspended from the center sill. The preventive coils are provided with a large air gap to improve the wave shape, and to minimize the dips in tractive force during acceleration.

Because of the high secondary currents and in order to simplify the car wiring some of the main motor circuits use insulated copper bars. Especial care was taken in the layout to obtain proper neutralization of the reactance of adjacent conductors in order to minimize the car wiring reactance.

Control

There is a master controller at each end of a two-car unit. These controllers are of the conventional type for single-phase cars. The acceleration is automatic and under the control of a current-limit relay. A slack-taking connection and nine control steps are provided which give smooth acceleration. The operator may select one of the three running speeds, which are: a switching point, half-speed, and full speed.

The main control box contains the following:

(a) The main, preventive-coil, transformer tap changing, and field changeover contactors are duplicates of those used on the locomotive except that they are modified for box mounting. They are air operated and as compared to earlier a.c. contactors have more accessible and effective arc chutes and simpler mechanisms in that the thrust of the air piston is applied directly to the moving contacts. The larger tips and higher contact pressures permit higher current with less contact burning.

(b) The sequence switch which is of a new, positive-action, type consists of an air-operated drum having control fingers of a type compensated for wear which, through contact with the drum segment, completes the contactor magnet valve circuit and determines the contactor sequence.

(c) The limit relay which insures that while notching the controller, the main currents have fallen to a definite value before the next step is taken.

(d) The potential relay which like the limit relay is of the rotor type, automatically controls the field shunting changes at the proper speeds.

(e) A slip relay which prevents excessive motor speeds through wheel slipping by shutting off the power when there is a determined differential between the voltages of the two motors.

(f) A reverser which is air-operated and works on the same principle as a double-pole, double-throw unit switch.

An auxiliary contactor box contains a carbon pile regulator and auxiliary contactors and pilot relays for the operation of the blower motor, generators, compressor and heaters, together with knife switches and fuses.

The blower motor-generator set which supplies cooling air consists of a 35-h.p., 380-volt, single-phase induction motor for driving the fan, together with a generator mounted on the same shaft for charging the 32-volt control battery.

Remote control of the compressor, blowers, generators, heat and a control cutout are provided by tumbler-type switches mounted in a panel in each control vestibule.

The cooling air which is supplied by the fan mounted on the blower-motor-generator set is taken in at both sides of the car through louvres in the side sheets. This air intake provides a cleaner supply than if taken in beneath the car floor. Because of this, and the fact that the traction motors are of low voltage, it was considered unnecessary to filter the air. A filter box fitted with cloth snow-screens removes the snow from the transformer air during the winter season. The air requirements are estimated as follows:

Two traction motors	4,800 c.f.m.
Transformer	2,200 c.f.m.
Preventive coil	250 c.f.m.
Main field shunt	150 c.f.m.
Total requirements	7,400 c.f.m.

The air to the traction motors is delivered into the center sill and taken off at each side through flexible connections to the motors. Such a system of bends, angles and changes in velocity necessarily produces large drops in pressure. In order to obtain the required amount of air through the motors the Pennsylvania engineers, in conjunction with the engineers of the electrical companies, experimented with one car and devised a system of duct deflectors which gave the required air with some leeway.

Performance

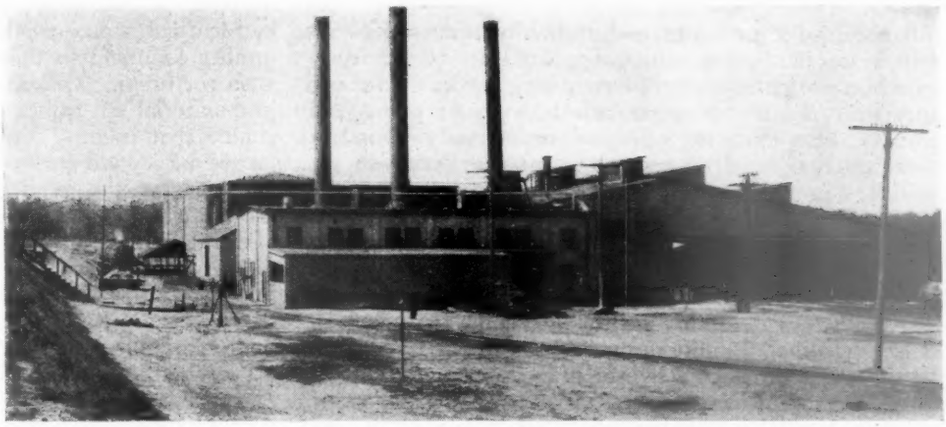
The performance curve shown for the two-car unit includes all losses from trolley to rail, including blowers and air compressor load. This same figure shows the curve of the earlier motors superimposed on that of the new cars, allowing for the variation in weights. This comparison shows how nearly perfectly the two types of cars operate together in train.

Considerable investigation was made to insure smooth acceleration. This was accomplished through care in the selection of the proper transformer tap voltages, and through the use of a preventive coil with an especially large air gap. This smooth acceleration has been obtained while providing an extra notch, not normally used, to prevent too severe starting with high trolley voltage. The maximum increment of tractive force has been reduced from 3600 lb. on the earlier cars to approximately 2300 lb. This improvement in starting has been obtained without increasing the weight over that of previous equipments.

On the basis of Davis train resistance curves, a two-car unit will balance at approximately 70 m.p.h. on level tangent track with 11,000 volts trolley potential. The average accelerating rate of approximately 1 m.p.h.p.s. is maintained from standstill to 30 m.p.h. Because of the steep speed curve, speeds of 50-60 m.p.h. are reached, except for a few cases, in less time than with cars having higher initial rates of acceleration.

One point raised against the use of a two-motor equipment to handle a trailer was the high adhesions necessary at starting. Through careful selection of the tap voltages, the peak adhesions have been kept to a minimum. The values of adhesion employed on these cars are within established practices.

The motor-car-trailer combination reduces the fixed charges and the maintenance since the number of parts of the electrical equipment is practically halved. The cars prove that a high-speed, large-capacity, two-motor unit is entirely practical with single-phase low-voltage equipment powered from a high-voltage contact line. Despite the increased duty on the equipment it is expected that the maintenance per motive equipment will be considerably less than the present due to the improved features described in the foregoing.



Treating Plant of the Santa Fe Tie & Lumber Preserving Company (a Subsidiary of the Atchison, Topeka & Santa Fe), at Somerville, Tex., at which 251,984,657 Cu. Ft. of Timber Have Been Treated to December 31, 1933, Including 65,485,752 Ties

Air-Seasoning of Wood for Preservative Treatment*

A review of more than a quarter century's studies and experiments at Somerville plant to develop measures to reduce losses from decay in seasoning

By W. E. Jackson

Superintendent, Santa Fe Tie & Lumber Preserving Company, Somerville, Tex.

IN the early days of timber treatment, wood preservers faced difficult problems. Ties and timber were cheap, while labor was inexpensive and it was hard to convince managements that treatment was economical. Furthermore, the men in the maintenance of way department did not like to handle treated material, claiming that the creosote poisoned them and affected their eyes, while the railroads had many suits on claims of creosote burns. Transportation officers complained because the ties contaminated the cars. Bridge and building men would cut, notch and bore creosoted timber and piling and take no preventive measures to protect the exposed untreated portions of the stick. The section men would ram picks into treated ties to pull them under the rail and adze off treated wood under the rail base.

These were a few of the trials of the timber treater. There were, however, two still more serious problems that called for immediate action. First, users wanted to know what life they might expect from treated timber, whether treatment would prolong the life of a certain species of wood and how long? Would treatment be effective under certain climatic conditions? Would the preservative leach out when the ties or timbers were in contact with the soil? These and numerous other questions were being asked and the only way to answer them was through service records. To get these, the railroads began to establish test sections in many parts of the country. These early test sections have given us wonderful service records.

The second problem was the fact that we were receiving numerous reports of failures of treated timber. Many samples of these supposed failures of treated timbers were sent to our treating plant, and while we were satisfied that the timber was decayed before treatment, we could not understand how it got through the plant without being detected by our inspectors. Our officers asked for an explanation. If, as the users claimed, the treated timber was failing, our treatment was deficient; on the other hand, if these failures were due to the treatment of decayed material, the operators of the plant were at fault, so under either circumstance it was up to us to get busy.

Discovery of Interior Decay

We began to watch the material on the yard, to check conditions after different periods of seasoning; we also watched the material as it came into the yard. Up to this time we had yarded all material for a set length of time before treatment. As I remember, pine ties were held on the yard for 4 months, oak ties 12 months, piling 5 months, small lumber 4 or 5 months, and large timbers 8 to 10 months. By watching material as it was unloaded, we soon found that it was not being brought into the plant promptly after being cut, some ties in a car being fresh off the stump while others in the same car looked as if they had been made two or three months before. To overcome this, we arranged for all material to be dated by the inspectors, with either a hammer or a stencil and each month's inspection was piled separately when received on our yard.

During this time we had instructions to watch closely for fungi, especially the brown species. If we found a tie with fungus on it, we were to burn it; if it was on a large timber or pile, the stick was to be cut back until it showed sound wood. With all these precautions, we

*Abstracted from a paper presented before the thirtieth annual convention of the American Wood-Preservers' Association at Houston, Tex., on January 25.

still received complaints and it finally occurred to us that a tie or timber which appeared to be perfectly sound on the outside might have decay inside. To check up on this we began to cut off the ends of piling and timbers. To our surprise we occasionally found a stick which showed no sign of fungus or decay on the outside, but which, when cut off, showed bad on the inside.

We did not realize how serious this situation was, however, until 1912, when we had a large stock of untreated piling on our yard. When this piling had seasoned about five months, we cut into some of the sticks to ascertain their condition and found sap rot. We were then instructed to cut a two-inch section off the end of every pile before treatment; if any further signs of decay were found, a two-foot section was cut off and we continued cutting back until the timber showed sound or the whole stick was found to be decayed. The result was that we lost several hundred sticks of this piling, in addition to spending quite a sum for labor in handling and sawing it. There were no outside indications of decay on any of the piles. During the time the piling was being cut, we tried to find if there was any way to determine the condition of a stick from its outside appearance and found that the men doing the sawing and the foreman in charge could not tell anything about the piling until they cut into it.

Trim Saws Uncover Ends

About this time we installed trim saws on our boring and adzing machines and found the same conditions in ties. From our experience of 1912, we concluded that we were seasoning our material too long, especially in the summer months. The next year we learned something else—that piling cut in the same months and given the same seasoning as in the previous year was not only sound but was too wet to take a good treatment. After trim saws were put on our boring and adzing machines, every tie was closely inspected after the ends were cut off. We found that in some years we could treat 2,500,000 to 3,000,000 ties with a loss of 0.5 to 1 per cent on account of decay, while the next year, with practically the same weather conditions, we would lose 4 or 5 per cent. In every instance, the decayed ties were practically all of one month's production. The first bad ties we found were of May production, so we decided that ties produced in this month were to be watched. After a few years we found that ties cut in the months of May, June, July and August were liable to give trouble, but that in any year in which the ties were bad they would be ties produced in only one of the above months. For illustration, if the May and June ties stood up satisfactorily, we were liable to lose July ties while the next time it would be August. Another thing we found out was that the fungi put out fruiting bodies some years and not in others. I recall one year when we found quite a few brown fungi on ties in the yard that we were sure we would have a big loss, but on putting the ties through the machines, we found that only ties with fruiting bodies on them showed any signs of decay and even in these it was just starting.

With respect to material other than ties, piling and poles cut in the summer months were especially liable to loss on account of decay during the seasoning period. The condition that kept us confused was the fact that we would go along for five or six years with no trouble from decay and then with the same class of material and the same seasoning conditions, we would lose a lot of piling and poles.

This brings our experiences up to 1920. Summing up what we had learned, or better what we thought we had learned, we concluded that all ties, poles, piling and lumber coming into the plant were likely to be infected with rot fungi. To account for the fact that we usually lost material cut in one of the summer months, we concluded that fungus, being a plant, is accelerated or retarded in growth by weather conditions. If we have an early season, the fungi mature and their fruiting bodies are distributing spores probably as early as the middle of May. In normal years, this condition obtains in the month of June, while when the season is late, it occurs in July. In line with this fact, our idea is that when a tree is cut down and a tie made at the time when the fungi are giving off spores, the wood cells of the freshly cut stick offer an ideal landing place for these spores. A spore that lodges in the freshly cut stick does not start to grow immediately, but lies dormant, due probably to the fact that the sap in the green stick is somewhat toxic. For this reason there is no trouble until the stick begins to season, but when the conditions get right inside, the spore germinates and damage begins.

The Seasoning of Piling

We have found that there is quite a difference in the seasoning of the different timbers we receive on the yard, and I have divided them into three classes. In the first group are piling, poles and round posts, which are trees cut to length and the bark peeled off. As the wood structure of the tree is not disturbed, the only place for a fungus spore to find lodgment is in the ends of the stick. These round timbers, in seasoning, begin to lose moisture at the ends while the remainder of the stick seasons slowly, until longitudinal checks begin to show up in the sap wood. If a spore of the rot fungus comes to life during the seasoning period and starts into the stick, it does not advance far until it finds the air supply insufficient or too much sap and its destructive activities are retarded.

It is not unusual, when cutting piling before treatment, to find well-developed decay near the end of the stick, and by cutting back six inches, find sound wood. For this reason, in a year when piling and poles go bad, it is possible to reclaim a large percentage of them by cutting back to shorter lengths. To prove that our theory on piling was correct, we steamed 33,475 lin. ft. of green piling in 1921 and gave it a zinc treatment. This piling was then put back on the yard and held until needed, when it was given a regular creosote treatment. This is an ideal method to avoid losing piling by decay and we found that it seasoned rapidly after the preliminary treatment. Two sticks of this piling were held for test and after being on the yard for one year, they were cut and showed no signs of decay.

During 1922, we gave green piling a steaming, followed by a Rueping creosote treatment. This procedure saved the piling but was quite expensive and the small amount of creosote that we put in after steaming caused the piling to season slowly after it was put back on the yard. We also found this piling rather difficult to treat, due possibly to the fact that the preliminary creosote treatment caused case hardening. In 1923, we steam treated 95,510 lin. ft. of green piling, putting it back on the yard for seasoning, without giving it any preservative treatment. In 60 to 90 days it took treatment like piling that had been air seasoned on the yard for five months. As a test we held a few sticks of this piling on the yard for one year and when they were cut they showed no signs of decay.

From this experience, it would seem that we had proved beyond a doubt that the steaming of all piling as soon as it is received on the yard will eliminate all

possibility of loss by decay during the seasoning period. We also proved to our own satisfaction that the piling was infected with the rot fungus in the woods.

Seasoning Ties and Sawed Materials

The second class of material to consider is the hewn tie. The hewed tie, of all timbers which we handle, is the most liable to reach the plant infected with spores of rot fungi. The tie is made where the tree is felled and in the making, it is rolled around on ground covered with leaf mould and decaying vegetation. Also in squaring up the tie with the axe, the wood structure is cut into for the full length of the stick and, unlike piling and poles, the spores are able to find lodgment on the sides as well as the ends of the stick. After the tie is received at the plant, the seasoning is quite different from that for round sticks, as the annual rings of the wood have been cut into and the seasoning along the full length of the stick is more rapid. For the same reason, if a rot fungus should germinate, the growth is accelerated because of the fact that air is present along the whole length of the tie. For the last 13 years all of our ties, except oak with anti-checking irons in the ends, have been put through boring machines and the ends have been trimmed. As mentioned before, in some years the loss from decay is very small, while in others when a certain month's production goes bad we have a large number of degrades.

The third class of timber covers all sawed material coming from the mills—lumber, dimension material, switch ties and sawn track ties. If our theory is correct that timber is infected by spores of rot fungi at the time the tree is cut in the woods, and that the fungi do not germinate until seasoning has advanced to a certain stage, this class of material should reach the seasoning yard in good condition. That sawed material does not reach us free from infection is due to unsanitary conditions around the mill—decayed timbers in tram-ways, loading docks and skids, and failure to trim the ends of timbers. Also, this material should be moved into the plant promptly. In the last few weeks we lost some large timbers on account of sap rot. In putting these timbers through the mill for trimming and sizing, we found several that showed sap rot in the ends. Some of these were cut back to shorter lengths, but in a few the decay went the full length of the timbers. If these timbers had been trimmed at the mill at the time they were sawn, we would not have lost any of them.

Some mills have used a dip for timbers coming from the saw, to prevent mould and sap stain. With a timber coming from the saw, freshly cut on all sides and ends, any spores carried on to it by the saw or by the wind will be on the surface and not sealed in by resin. With this condition, it is possible that a dip of a poisonous solution, or if this were not feasible, the application of heat in the form of water or steam, would kill the spores.

Moisture Content

A few years ago we decided that there might be some connection between the moisture content of a tie and decay. For the last three years we have, therefore, been checking the moisture in ties during the seasoning periods and have discovered some interesting facts. In making moisture determinations, we section the tie so as to ascertain the moisture in the first, second and third inches and the center. We decided a few years ago that a tie would take a good treatment when the moisture content was not over 20 per cent in the first and second inches; later we found that this was satisfactory for ties seasoned in the summer months but when seasoned in the winter, a tie gives up moisture very slowly and in some years it has not been practical to hold the tie until it reached a 20 per cent moisture content, while on the other hand, if we treated ties with 30 per cent moisture, we were liable to get poor penetration.

To make a moisture determination and get anything like accurate results, it is necessary to cut the tie at the rail base and in the center. In addition to loss of the tie, this requires quite a little time. We also found that the moisture content varies in ties in the same piles, depending on the location of the tie. Thus, a tie in the top layer of a pile may show 20 per cent moisture while one from the center of the same pile will show 30 per cent. It seems reasonable to believe that weights will give us about the same results as moisture determinations, and it is possible to weigh any number or all of the ties treated, as compared with a moisture determination of one tie out of thousands. To check this, we weighed several thousand ties of each month's production and made moisture determinations on at least three ties of each month, with the following results:

Date Ties Produced	Time Seasoned	Average Weight 7 in. by 8 in. No. 1 Hewn Pine Tie	Percentage Moisture Content
December	4 to 4½ months	145.4	42.0
January	5 months	134.8	40.2
February	4 to 4½ months	133.3	26.0
March	4 to 4½ months	127.5	26.3
April	4 months	128.7	17.5
May	3½ to 4 months	129.2	19.0
June	3 months	129.9	21.8
July	3 to 3½ months	125.6	20.6
August	2 to 2½ months	132.8	23.2

We all know that timber seasons faster in the summer months and also that the seasoning varies with the location of the seasoning yard. From experience at our plant I have worked up the following seasoning calendar:

January	equals ¼	seasoning month
February	equals ¼	seasoning month
March	equals ¼	seasoning month
April	equals ½	seasoning month
May	equals ½	seasoning month
June	equals 1	seasoning month
July	equals 1	seasoning month
August	equals 1	seasoning month
September	equals 1	seasoning month
October	equals ½	seasoning month
November	equals ½	seasoning month
December	equals ¼	seasoning month

Using this calendar and referring to the weights of ties in the above table, we find that December ties held on the yard for four months really had 1¼ months' seasoning while May ties on the yard three months had three months' actual seasoning. This shows that winter-cut ties held on the yard four months will go into the cylinder with too high a moisture content and, while the final retention of preservative may be just right, there are liable to be water pockets with absolutely no treatment, that will cause the tie to decay in a few years.

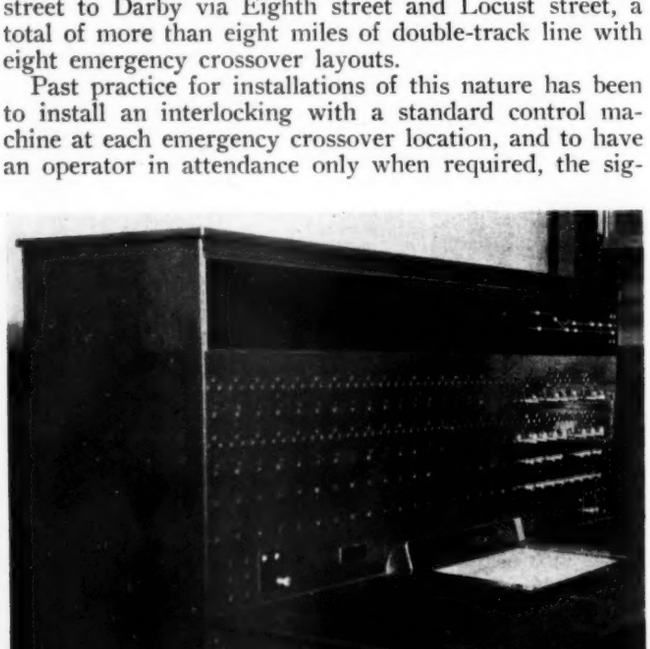
We have found that the best method for determining whether a given lot of material is ready for treatment is to test the timber for moisture content and distribution. While it is difficult to judge several thousand ties by testing only a few of this number, these tests, together with the average weights of ties of a given dimension and a careful checking of results of treatment are usually reliable.

JOINT ARRANGEMENTS have been entered by the Rutland and the Eastern Air Transport, Inc., for a co-ordinated rail-air service from points on the Rutland to New York and cities as far south as Miami, Fla. The plan includes a 22-hr. schedule between Montreal and Miami, including one night in a Pullman sleeping car between Montreal and New York, or the reverse. The arrangement is in addition to the combined rail-air service which has been operated between New York and Montreal by the Rutland, in conjunction with the American Airways, since last December.

C. T. C. in the Philadelphia Subway

CENTRALIZED traffic control, as developed on the trunk line railroads, is being adopted for use also in subways, the Philadelphia Rapid Transit Company having installed a large c.t.c. machine for handling a section of the recently completed Ridge Avenue line. The new c.t.c. machine, located in a tower at Fairmount avenue on the Broad Street line, in addition to controlling the Market Street interlocking on the Ridge Avenue line, has spare spaces for the control of the switches and signals for directing train movements on the entire Locust Street subway, projected from the Camden bridge connection at Market street to Darby via Eighth street and Locust street, a total of more than eight miles of double-track line with eight emergency crossover layouts.

Past practice for installations of this nature has been to install an interlocking with a standard control machine at each emergency crossover location, and to have an operator in attendance only when required, the signals operating as automatics at all other times. This practice necessitates numerous small interlockings and expensive tower buildings, as well as added expense of operators and delayed traffic in case of a tie-up. To avoid this, the alternative was to control all locations from one point.



The C. T. C. Control Machine is Located in the Tower at Fairmount Avenue

The signal system selected will be required to accommodate the ultimate track layout and the following train operating schedules: A four-minute headway, four hours per day, between Fairmount and Market street; Market street and Camden; 22nd street and Darby (22nd street being assumed to be a turn-back point between Market street and Darby); a two-minute headway, four hours per day between Market street and 22nd street; a 6-minute headway, 16 hours per day, over the entire system; and a 20-minute headway, 4 hours per day, over the entire system.

The code principle of centralized traffic control was adopted because the number of controls and indications involved made any direct-wire control and indication impracticable. The characteristics of the centralized traffic control system made it possible to concentrate at one point the control of switches and signals, and to provide indication of the occupancy of track sections over a greater territory than ever before accomplished in subway signaling. The c.t.c. control machine is equipped with a train graph that automatically records the passage of trains on both tracks at Market street, and also records the passage of all trains on each of the four Broad Street Subway tracks at Fairmount avenue. Provisions have been made to add extra pens to the train graph for the ultimate signaling arrangement.

With this installation, Philadelphia is the first city to utilize c.t.c. equipment for subway signaling, and thus take advantage of what has proved, on steam roads, to be an economical means to speed up traffic and lower the cost of operation.

New Books . . .

Signal Section, American Railway Association; Proceedings, Volume XXX, 1932. 520 pages. 6¼ in. x 9⅜ in. Cloth binding. R. H. C. Balliet, Secretary, 30 Vesey Street, New York City. Price $8. To members of the Signal Section $4.

These proceedings include the business done at the annual meeting, in New York, on May 9 and 10, 1933. The committee reports were unusually full, and dealt with important subjects. Committee VI, Designs, brought in supplementary reports dealing with standardization of color glasses. These fill 76 pages. The report of Committee I, Economics of railway signaling, fills 42 pages. It is largely made up of actual results, with drawings, of recent money-saving changes in signaling, together with various items of signaling history, extending back to 1842, when Sir William Fothergill Cooke proposed telegraphic train dispatching.

Railroad Consolidation West of the Mississippi River, by Stuart Daggett. 256 pages, 10¼ in. by 6¾ in. Illustrated with maps. Bound in paper. Published by the University of California Press, Berkeley, Cal. Price $2.

The stated purpose of this monograph is to gather in one place, in convenient form for study, a number of plans for the grouping of railroads west of the Mississippi river under the provisions of Section 5 of the Interstate Commerce Act. Thus the task which the author, in his introduction, sets up for himself is "to develop the alternatives for the western groupings of major Class 1 companies, with such history, description, and analysis as will make clear the nature of the judgments involved in the association of certain railroad companies rather than the association of certain others in the period between 1920 and 1932." Concluding sections discuss the advantages of consolidation and summarize results in that direction thus far achieved in the West. The treatise is No. 2 of Volume 11 in the "University of California Publications in Economics" series.

Steel Trails, The Epic of the Railroads, by Martin D. Stevers. 374 pages, 9¼ in. by 6 in. Illustrated. Bound in cloth. Published by Minton, Balch & Company, New York. Price $3.75.

Here, done in popular style, is an interesting treatise on modern railway operations. That, in any event, is the main purpose, but the book includes also a brief account of invention which made railway transportation possible and a few chapters on United States "railroad kings" who practiced high finance in the 'sixties. Because this latter story has been told before, in more arresting fashion, the chapters dealing with modern operating technique are the more interesting. These cover all phases of railway operation—locomotive and track maintenance, train operation, dispatching, signaling, passenger service and its ticketing arrangements, freight service and its tariff structures, and what not. In doing a thorough job in this connection the author has adopted the interesting and effective plan of taking his readers about the country to observe with him the functioning of modern facilities. Thus, for example, the reader learns about engine-

house operations by visiting the New York Central's facilities at Harmon, N. Y.; he sees passenger trains groomed for service at the Pennsylvania's Sunnyside (N. Y.) yard and gets an insight into l.c.l. transfer operations by watching the Chicago & North Western do the job in its Proviso yard, near Chicago.

While Mr. Stevers is guilty of an occasional technical lapse, these, being few and far between, may be overlooked since the average reader, dropping details to carry away a general view, will obtain from the book that broad, general and substantially accurate picture of modern railroading in which he is interested.

Communications . . .

Monopoly Myopia

WARRENVILLE, ILL.

TO THE EDITOR:

Referring to your article, "Passenger Salesman Replies": I have been, but am not now a "passenger salesman." Therefore I can put the blame boldly where it belongs. The railroads' organization is based on the assumption they are a monopoly, which is no longer true. When they were a monopoly they could dispense with a sales force and use change makers like Woolworths. Change makers will no longer serve. But monopoly myopia now sticks its head in the sand.

E. M. MOORE.

Safety Regulations for Trucks and Buses

NEW YORK.

TO THE EDITOR:

I have read with much interest your various papers on truck regulation and quite agree with the idea that justice requires equality of regulation, and I think this idea has gained ground throughout the country.

I beg to suggest to you, however, that there is another line which will I think appeal more widely to the people of the country. It is the need of safety regulations for trucks and buses. At present one driver takes a bus or a truck for a tremendous run. He frequently goes to sleep and the truck runs off the road or worse, from the public standpoint, he runs into something and there have been an enormous number of accidents of that character. I think trucks should be required to have two men on the box and that the limit of a crew run should not exceed 150 miles.

The speed schedules of buses should be limited, as well as the distance permitted to any one driver. In case the bus falls behind its schedule, it should not be allowed to make up by fast running. There are doubtless other safety regulations which will occur to you. My point is that there is great popular support in a public safety campaign against both trucks and buses and the labor people would doubtless approve of a regulation of hours and provisions for an additional driver. I may add that near my own country place, Garrisons, New York, there have been one-half dozen serious accidents caused by trucks and bu es during the last twelve months.

WM. CHURCH OSBORN.

Looking into the Future

CHICAGO.

TO THE EDITOR:

In view of the unsettled conditions confronting the railways at the present time, the following remarks made by E. F. Carry, late president of Pullman, Inc., before the American Railway Association at Chicago, in 1923, are apropos.

"In London the other day, the London One Hundred Years Hence Club was organized. What a magnificent thing it would be if we could have some such organization in this country to try and utilize the energy, even the enthusiasm that today is being expressed to retard, to restrict, to do most anything to interfere with railroad growth. If we could only utilize that energy, what a wonderful country we would continue to be.

"I say continue because a nation is no greater than its transportation facilities. A nation that cannot mobilize its resources cannot compete with a nation that can do so. By sheer force of the energy and ability and ingenuity of the American railroad man, this country has kept ahead of the procession in its transportation facilities but there is a limit to what the human mind can stand in the way of oppression. There is a limit to human enthusiasm and when you kill off a man's enthusiasm you kill him. There is nothing left. Unless a man is enthusiastic over his job, he cannot be proficient. If every time he turns around he is batted by somebody not familiar with the work in which he is engaged, that worker is going to lose interest. If enough railway employees lose interest, what is going to happen to the railroads? If railroads become inefficient, what will happen to the country?"

I believe there is a greater need for looking into the future now than existed ten years ago. In that prosperous year, we did not heed the warning of the late Mr. Carry. Probably we can think clearer in this year of depression.

HANS L. MARTINUS.

Traffic Men Are Not Shippers

TO THE EDITOR:

As a traffic man of many years' experience, I wish to comment upon your article on Page 900 of the December 30 issue headed "Does the N. I. T. League Truly Represent Shippers?"

Probably the industrial traffic man merits more or less of the criticism which you offer; however, I think you have overlooked one of the very significant things. I would suggest you check up on the extent to which commercial club traffic bureaus, chamber of commerce traffic bureaus, and municipal traffic associations are represented in the League and substantially influence, or possibly dominate, the League action particularly in regard to the railroads being granted the right to meet competition of other transportation.

Such association men have a multiplicity of bosses, the majority of whom at least are solely interested in securing the cheapest possible transportation, particularly to the end of distributing their products as far as possible into competitive territory. If you will check over the executive committee of the League for 1932, you will find about twenty-four of the total forty-nine members of that committee represent associations instead of individual industry. As you have apparently overlooked or are not aware of this angle of the matter, which incidentally is one of the reasons why I have not felt warranted in becoming a member of the League, I take the liberty of drawing it to your attention.

AN INDUSTRIAL TRAFFIC MANAGER.

[We were aware of the membership of many commercial club traffic managers in the National Industrial Traffic League, but had made no attempt to check the degree to which they participate in its direction. In any event, the theme of our comment, i.e., that traffic managers are not shippers, but rather are employees of shippers with interests which may or may not agree in all respects with those of their employers, needs no change. This is likewise true of the corollary to that statement, namely that the answers to the questionnaire of the Chamber of Commerce of the United States on transportation policies provides a more accurate gage of the views of actual shippers than does the stand on these questions taken by the National Industrial Traffic League.—EDITOR]

JANUARY SHIPMENTS OF RAILROAD LOCOMOTIVES from principal manufacturing plants, as reported to the Bureau of the Census, totaled 4, as compared with 8 in December, 2 in January, 1933, and none in January, 1932. Unfilled orders at the end of December, 71 at the end of January, 1933, and 177 at the end of January, 1932, and 110 at the end of January, 1931. These statistics do not include data on locomotives produced by railroad companies in their own shops.

Odds and Ends . . .

Frisco Veteran Retires

C. W. Schank, the oldest man in point of service on the Frisco Pension Roll, retired on December 31, 1933, after completing 53 years and 9 months of continuous service on one division of the St. Louis-San Francisco. Starting as an engine wiper in 1876, when 13 years of age, Mr. Schank became a locomotive engineman at 24, and he continued to pull trains, first freight and then passenger, between St. Louis, Mo., and Newburg, until his retirement.

Why the Train Left Earlier

Not long ago, we reported the findings of the Canadian National's publicity department that the re-laying of rail over the entire Canadian National system would require 15 more miles of rail, due to natural contraction, in winter than in summer. Somewhat along the same line is the story now being told about a diplomatic ticket agent on the Canadian National. Last summer, he was reprimanded by a woman passenger for telling her that her train left at 9:05 when she had already looked it up in her own timetable, issued the previous winter, which stated that the train left at 9:40. The ticket agent was too tactful to tell her that she would have to wait six months if she insisted upon leaving at 9:40. Instead, he went into a detailed explanation of the fact that in summer the rails are expanded by heat. Earnestly, he told the woman that the expansion was so great that it was necessary to start trains 35 min. earlier in the summer in order for them to reach their destination on time.

Aluminum "Lucky Piece"

To mark the completion of its new high-speed, light weight, streamlined passenger train, the Union Pacific is distributing 1,000,000 "lucky pieces" made of the same aluminum alloy of which the train is built. The first of these have been sent to editors, publishers and writers who have had a part in the unprecedented advance publicity which the train has enjoyed, and the remainder will be given to school children and to visitors who see the train on its exhibition tour. No less than five tons of the aluminum alloy was required to make the 1,000,000 lucky pieces, the two sides of which are shown in the accompanying illustration.

The Union Pacific Aluminum "Lucky Piece"

Switching Puzzle for Experts

Apparently the switching puzzle published on the "Odds & Ends" page of the *Railway Age* of January 6 was too simple. A large number of solutions have been received and all of them —even those from people outside the railroad business—are correct. We shall not publish the answer yet in anticipation that others may still want to have a try at the puzzle. In the meantime, though, we are glad to pass along another and much harder puzzle contributed by "A Nonny Muss" of Topeka, Kan., who writes as follows:

"The switching puzzle referred to in your issue of January 6 has been correctly diagnosed; it is decidedly 'elementary' and was solved daily by countless trainmen of an earlier day before our spur tracks became passing tracks and before our passing tracks outgrew our trains in length. If Mr. Lloyd thinks his problem a 'brain teaser,' I am wondering what he would do if he had been a conductor on one of two freight trains of 8 or 10 cars each, moving in opposite directions, which met out on the landscape where there was no passing track, nor any break in the continuous main line except a turntable which was only long enough to hold one locomotive and one car, but not long enough to hold two locomotives. The trains had to pass—and they did!"

This department is eager to know what the puzzle addicts among its readers can do with that one. Communications concerning it will be gratefully received.

How to Tell When It's Foggy

Always interested in learning how railroading is carried on in foreign countries, this department recently has had its attention closely engaged by a booklet entitled "Questions and Answers on Railway Permanent Way," published by the Locomotive Publishing Company of London, England. Here is one of the questions and answers which we particularly liked:

"How is foggy weather determined?

"This is altogether a matter of judgment according to local circumstances, and is a matter which is left to the discretion of the station master or signalman. A good method, employed by one of the large English railway companies, is that of having a small post fixed, and painted white, with a disc fixed on the top of the post. These posts and discs are placed at a distance of about 170 yd. from each signal cabin, and should the signalman be unable to see the post in question, he takes the necessary steps for bringing in fog-signaling arrangements. The disc is fitted with a lamp so that after darkness has set in, the signalman may estimate the state of the atmosphere by lighting the lamp, and viewing it from the cabin, thus satisfy any doubts that may arise in his mind. The disc should be painted with a large white cross on the front—the rest of the target being red —so that drivers may not read it as a running or shunting signal."

Knowing whether or not it is foggy is an important question in England, where the activity involved in the placing of forces and equipment to overcome fog conditions would appear to correspond roughly to that which ensues in this country pursuant to a four-alarm fire. Naturally, the English railways would not want to send their elaborate fog-fighting organization into action for a mere haze or even a medium-thick fog.

All About That Funeral-Train Ticket

One of this department's good friends in the personnel department of the New York Central has given us the answer to the question raised by D. T. Peckens, assistant auditor, Lake Erie, Franklin & Clarion, in our issue of January 6 as to the identity of Dean Richmond for whose funeral a special ticket was issued by the New York Central for transportation from Buffalo to Batavia and return on August 30, 1866. Mr. Richmond was a member of a substantial western New York family, the name of which is borne by a street in Buffalo. He was a director of the Buffalo & Rochester railway, which was one of the many short lines which were combined into the original New York Central Railroad Company on July 6, 1853. He was a member of the consolidation committee appointed by all those short lines and was one of the original directors of the New York Central when amalgamation was completed. He was elected president of the new company on April 28, 1864, and continued in that office until his death, which occurred on August 27, 1866. The ticket referred to by Mr. Peckens was issued for passengers who desired to attend the funeral. It is unlikely that any charge was made for the tickets, since restrictions on free transportation were unknown at that time. It is probable also that no attempt was made to collect these tickets from passengers and that they were issued solely for future historical interest. The notarial seal on the reverse side of the ticket had no connection with its issuance by the railroad. Possibly it may have been given to Notary Thurstone who used this means of identifying himself with it. That is the one point of the mystery which our New York Central friend is unable to clarify for us. J. Tillinghast, assistant superintendent, whose name appeared on the ticket, later became general superintendent of the New York Central. At one time he made his home in the station building at Niagara Falls so he could be easily reached at any hour of the day or night, in those ante-telephone days.

NEWS

President Proposes Plan for River Improvements

Interdepartmental committee is now working out a long-range development program

President Roosevelt, with the assistance of an interdepartmental committee, is seeking to work out an arrangement for placing the development of the rivers and watersheds of the United States on a planned basis, under the direction of a planning commission which will look forward twenty-five or fifty years and take into consideration the relief of unemployment, flood control, soil erosion, reforestation, agriculture, the decentralization of industry, transportation, and water power. As a part of the plan there is also being studied the proposal which the President has previously advocated for imposing a tax on the users of water highways to cover at least the cost of their maintenance.

A report on the subject is expected in a few weeks from a committee including representatives of the departments of Agriculture, Interior, Commerce, War, and Labor, to which the President has referred a resolution recently passed in Congress requesting him to submit a comprehensive plan for the improvement and development of the rivers with a view to giving Congress information for the guidance of legislation. The President takes the position that the government has had no real plan for river and harbor development and desires to substitute a planned policy for the present practice of approving projects in occasional rivers and harbors bills without a definite plan. The general thought, as explained at the White House, is that the interdepartmental committee shall work out a plan for a permanent non-political and non-partisan planning commission, to study the whole country by watersheds and list projects in each in the order of their importance, to be recommended to Congress, with a view to the expenditure of a more or less regular sum each year. It is also the thought that this would to some extent replace such projects as are now being prosecuted with the aid of the Public Works Administration, on the theory that there will always be occasion for affording relief for unemployment. Part of the idea is to experiment with the development of industry in areas where agriculture alone cannot be expected to furnish more than a subsistence, in order to afford wages for industrial work during part of the year. The President desires that such river improvements as are made be self-sustaining, at least so far as their upkeep is concerned, whereas the government is now spending $60,000,000 a year or more for maintenance of waterways. He also hopes to bring about more specific consideration of the economic need for waterway development. He has been much interested in proposals for the Georgia-Florida canal, which was at first estimated to cost $110,000,000 to $125,000,000, but after ordering a recheck the President has been informed that the cost might be $175,000,000 to $200,000,000 and that the prospective use for such a waterway would be less than was shown by the original estimates.

Senate Committee to Hold Hearings on Six-Hour-Day Bill

The Senate committee on interstate commerce has announced its intention of holding hearings beginning on March 1 on the six-hour basic day bill introduced by Senator Black at the request of the Railway Labor Executives' Association.

Railways Serve Notice on Employees of 15 Per Cent Wage Cut

The Conference Committee of Managers which entered into a wage agreement with railway labor executives on June 21, 1933 gave notice to employees on February 15 that on and after July 1, 1934 all now existing basic rates of pay will be reduced 15 per cent, such reductions to be continued in effect for a period of one year and thereafter subject to the provisions of the railway labor act. This reduction will supersede the present deduction of 10 per cent in the pay checks of employees which will expire by limitation on June 30, 1934. The committee proposes that an initial conference be held in the Union station, Chicago, on March 1.

R. & L. Historical Society

The thirty-third bulletin of the Railway & Locomotive Historical Society, Boston, Mass., which has recently been issued, is devoted entirely to a treatise on "Lincoln on the New Haven and the Boston & Albany," the data for which were gathered by Warren Jacobs, Secretary of the Society. About 50 pages of notes on the visits of Abraham Lincoln to New England in 1848 and in 1860 are given. The visit of 1848 was on the invitation of New England Whigs, Lincoln having served a term in Congress; and the visit of 1860 followed his speech in Cooper Union, New York City, on February 28 of that year. Mr. Jacobs has examined timetables, circulars and various records, as well as hundreds of local newspapers; and from the travel side of Mr. Lincoln's visit, has exhausted his subject to the very last detail. The article is illustrated by a few pictures of local scenes, taken in 1860 and earlier.

U. P. All-Aluminum Train Delivered on February 12

Road announces award of contracts for building of three additional streamlined units

The three-car articulated, all-aluminum streamlined train ordered by the Union Pacific from the Pullman Car & Manufacturing Corporation was delivered to the railroad by the builder on February 12 at Pullman, Ill. At the same time, W. A. Harriman, chairman of the board of the Union Pacific, announced that contracts have been awarded to the Pullman Car & Manufacturing Corporation for one additional six-car train and two nine-car trains, all three to contain sleeping cars. With these trains the railroad expects to reduce the schedule between Chicago and the Pacific Coast 24 hrs.

The new train was inspected by officers of the railroad, the Pullman Car & Manufacturing Corporation, the Aluminum Company of America and General Motors Corporation in the yards of the Pullman Car & Manufacturing Corporation. Among those present when the train was delivered were Mr. Harriman; Carl R. Gray, president of the Union Pacific; C. F. Kettering, president of General Motors Research Corporation; C. A. Liddle, president of the Pullman Car & Manufacturing Corporation; R. A. Hunt, president of the Aluminum Company of America; F. W. Charske, chairman of the Executive committee of the Union Pacific; W. M. Jeffers, executive vice-president of the Union Pacific; F. W. Robinson, vice-president of the Union Pacific; J. L. Haugh, vice-president of the Union Pacific; G. W. Codrington, president of the Winton Engine Corporation; H. L. Hamilton, president of the Electro-Motive Company; O. F. Brookmeyer, sales manager of the Railway division of the Winton Engine Corporation; S. K. Colby, vice-president of the Aluminum Company of America; D. A. Crawford, president of the Pullman Company and Pullman, Inc.; L. S. Hungerford, vice-president and general manager of the Pullman Company; E. E. Adams, vice-president of Pullman, Inc.; and Champ Carey, vice-president of the Pullman Company.

One of the outstanding features of the ceremony was a broadcast over the National Broadcasting network. At 10 a.m., Ben Lyon, announcer, described the train in detail, his microphone attached to a long cable enabling him to pass around and through the train. Because of the length of this cable, it was possible to set

the train in motion during the broadcast. After the preliminary description of the train, the speeches of Mr. Harriman, Mr. Gray, Mr. Hunt and Mr. Kettering were broadcast.

Mr. Harriman, upon accepting the train, said, "I am glad to be able to state that as a result of the satisfactory tests made by the General Motors Company of a new two-cycle, V-shaped Diesel engine, the Union Pacific already has under contract the construction by the Pullman Car & Manufacturing Corporation of three additional trains of this type. The first is a six-car train with a 900-hp. Diesel engine with mail and baggage cars, a 56-seat coach and three Pullman sleeping cars; the other two are nine-car units, each with 1,200-hp. motors.

"There must follow a period of practical trial and experimentation under varying conditions of grade, roadbed, climate, curvature and various operating conditions. The results of our experiments will be available to all other railroads of the country and it is no exaggeration to say that if these experiments are as successful as we expect them to be, they will lead to the gradual re-equipment of all of the passenger trains of the country."

Carl R. Gray, president of the road, following Mr. Harriman, said it was not a coincidence that the occasion was Abraham Lincoln's birthday. It was Lincoln, he recalled, who by executive decree established the first transcontinental railroad in the United States. Mr. Gray also recalled another day in railroad history, May 10, 1869, when the Union Pacific and the Central Pacific were joined by a golden spike at Promontory Point near Ogden, Utah.

After the ceremonies, the train moved to Washington where it was on exhibition on February 16. The train will later be exhibited in Baltimore, Md., on February 17; in Pittsburgh, Pa., on February 19; in Detroit, Mich., on February 21; in Chicago on February 23-24; and in Omaha, Neb., on February 28. It will then visit 48 cities along the Union Pacific.

R. F. C. Loans to Railroads

Up to January 31 the Reconstruction Finance Corporation had authorized loans to 67 railroads or receivers amounting to $411,845,678, of which $397,791,738 had been disbursed and $57,065,738 had been repaid. The total authorizations were the same as on December 31 while the disbursements show an increase of $3,697,480 during January.

Results of P.R.R. Store-Door Service Experiment

The increasing popularity of the Pennsylvania's l.c.l. store-door collection and delivery service was indicated in a report of that railroad's experience during the first two months in which the door-to-door tariffs have been effective. The report, made public on February 8 by Walter S. Franklin, vice-president in charge of traffic of the P. R. R., reveals that during December, out of a total of 273,000 l.c.l. waybills issued on the Pennsylvania, 41,000 or 15 per cent specified collection and delivery. This percentage increased to 21 in the month of January when 76,000 waybills out of the month's total of 359,000 specified pick-up or delivery. In recent weeks, the report says, that the proportion has ranged from 21 per cent to more than 24 per cent of all l.c.l. shipments.

Supplymen's Night at the Western Railway Club

The Western Railway Club will hold its regular monthly meeting at the Hotel Sherman, Chicago, Monday evening, February 19, at 8 o'clock in the Louis XVI room, the meeting being designated "Supplymen's Night." The principal speaker will be Samuel O. Dunn, chairman, *Simmons-Boardman Publishing Company*, and editor, *Railway Age*, who will discuss the subject "Prospects and Problems of the Railway Supply and Equipment Industry." Preceding the meeting, the usual Dutch-treat dinner will be held in the Crystal room at 6:00 p. m.

Frisco Plans Improvements in 1934

Trustees for the St. Louis-San Francisco have petitioned the federal court at St. Louis for permission to expend $1,671,719 for improvements during 1934. The improvements planned include rail and tie replacements on 100 mi. of line, $598,000; new bridges and trestles, $447,342; repairs and additional equipment, including two electric cars, $181,395; tank car and box car equipment and repairs, $101,213; grade revision in flood districts of Mississippi, $90,463; dining and refrigerator car repairs, $66,000; bank widenings and fills, $35,000; equipment and trackage improvements for the Ft. Worth & Rio Grande, $19,793; and miscellaneous machinery, signals and other equipment, $132,513.

Depreciation Order Postponed Another Year

On petition of certain of the railroads the Interstate Commerce Commission has postponed for another year the effective dates of its order of July 28, 1931, relating to the establishment of depreciation accounting for steam railroads, except that no further postponement is authorized so far as equipment is concerned. September 1, 1934, had been set as the latest date for the filing with the commission of composite percentage rates and January 1, 1935, as the date as of which depreciation accounting as prescribed was to become effective. Because of the unfavorable financial condition of the railroads the effective dates had been previously postponed by orders in 1932 and 1933.

Pacific Railway Club

The Pacific Railway Club will hold its seventeenth annual meeting at the Palace Hotel, San Francisco, on March 8. The newly elected officers will be installed at that time. Alfred H. Lundberg, president of the Key System, Ltd., East Bay Street Railways, Ltd., and East Bay Motor Coach Lines, Ltd., has been nominated for the presidency. Several speakers will discuss "Moving California's Most Important Crop to Market"; among them will be Scott Ennis, general chairman of the Pacific Coast Transportation Advisory Board and president of the Pacific Fruit Exchange; W. C. Fitch, manager of perishable traffic, Southern Pacific Company; and R. T. Kearney, superintendent, Tidewater Southern Railway Company.

Florida Travel Heaviest in Years

Travel to Florida so far this year has been heavier than during the same period in any year since 1929, exceeding last year's movement by about 50 per cent in both the eastern and western territories. The most encouraging feature of travel this year lies in the fact that about one-half of the tickets sold have an 18-day limit or less, which indicates that persons with short vacations are now spending their time in Florida. In the East, travel is marked by the large number of persons departing from the southwestern part of New York and from Canada.

To handle the increased travel to Florida, trains are being operated with extra cars and some with extra sections. One eastern train recently carried 400 passengers. The business of the Pennsylvania from Chicago during January was nearly double that of the corresponding month of 1933.

P. R. R. Benefit Association Has Twentieth Anniversary

Throughout February some 20,000 employees of the Pennsylvania and their families will celebrate by special exercises the twentieth anniversary of the establishment of their Mutual Benefit Association, which has eighty-four local assemblies in the principal cities on the railroad between New York and St. Louis and Chicago.

The association is owned, managed and operated exclusively by the employees. In addition to its fraternal features, the association provides a means whereby employees may obtain fraternal insurance at low rates, with complete safety. Their policies in the association at present amount to over $8,000,000, and in the twenty years of its existence the association has disbursed over $1,000,000 in benefits. Its insurance reserve is well over $2,000,000. All ranks of the service—officers and employees alike—are represented in the membership.

Sees Closer Union of Canadian Roads Unless Business Improves

Amalgamation of the management of the Canadian Pacific and the Canadian National will be unavoidable unless there is considerable improvement in operations during the present year, C. H. Cahan, Secretary of State, said at Ottawa last week in addressing the annual meeting of the Ottawa Women's Conservative Association and the Conservative Women's Forum.

The minister said he did not speak for the Government in making this suggestion, but that it was his considered opinion there would be no alternative to fusion of the two great railroads unless conditions improved.

"The main obstacle to the adjustment of our revenues and expenditures," Mr. Cahan stated, "is the deficit of about $50,000,000 per year in the annual income of

the Canadian National. That sum is equivalent to four per cent annual interest upon a public debt of $1,250,000,000.

"I know that there are large sections of Canada in which the public is opposed to any such consolidation of rival interests, but public opinion must yield to absolute necessity."

Air Subsidiary of New England Roads Extends Service

The Boston-Maine-Central Vermont Airways has recently extended its passenger service to Manchester, N. H., and Burlington, Vt., thus making a total of 10 northern New England cities which are served by this plane-operating subsidiary of the Boston & Maine, the Central Vermont and the Maine Central.

The extension provides Manchester and Burlington with a single round-trip service to Boston under present winter schedules. The plane leaves Burlington at 8 a. m., making stops at Montpelier-Barre, Vt., White River Junction, Concord, N. H., and Manchester, and arrives in Boston at 10:15 a. m. On the return trip the plane leaves Boston at 2:45 p. m. and is scheduled to arrive in Burlington at 5 p. m. The fare between Boston and Manchester is $3.50 one way, $6 round-trip; between Boston and Burlington, $12 one way, $22 round-trip.

N. Y. C. Shows Worlds Fair Exhibit in New York

A display of early and modern American railroading, which the New York Central will exhibit this year at the second edition of Chicago's Century of Progress exposition, has been placed on free exhibition at Grand Central Terminal in New York, where it will remain for three months. While the display incorporates portions of the one shown in Chicago last year, it has been re-designed and improved.

The exhibit includes a collection of railroad equipment models, historical pictures and documents, loaned by the Railway Locomotive and Historical Society and others. The center of the display is taken up with a reproduction of the observation platform of the "Twentieth Century Limited," with moving figures standing on the platform. The effect of the train in motion is simulated by the use of moving panoramas of Hudson and Mohawk Valley scenery on either side of the car end. Included also is a map showing the principal cities served by the New York Central, a reproduction of the Hudson river at Storm King mountain, with vessels moving up the stream and scale-built trains running in front along the eastern bank, and a reproduction of Niagara Falls, with changing day and night lighting effects.

Signaling Principles and Practices

The Signal Section of the American Railway Association, 30 Vesey Street, New York City, has issued two more pamphlets, chapters III and XIX, of the series of chapters on American railway signaling principles and practices, making the total number of chapters to date, 18. The new issues are, Chapter III, principles and economic phase of signaling, and Chapter XIX, electric interlocking. The price of each is 35 cents, or, to members or railroad employees, 25 cents. Chapter III contains a dozen pages of elementary matter, and 60 pages on economics. This latter part is made up largely of material which has been reported to recent annual meetings of the association, by the committee on economics; records of savings made by the introduction of automatic block signals, by consolidations of interlocking plants, by the introduction of automatic signals at grade crossings, by centralized traffic control and other remote control devices and by the use of car retarders.

Electric interlocking (Chapter XIX), which fills about 90 pages, contains all the well-known types, including table machines. There are also brief references to centralized traffic control and to automatic interlocking for grade crossings.

For the whole 18 chapters the price is $5.75; to members $3.95. Binders to hold 13 chapters, one dollar.

Jury Convicts Brotherhood Bank Officers

Alvanley Johnston, grand chief of the Brotherhood of Locomotive Engineers, and a director of the Standard Trust Bank, which closed in 1931 with more than $12,000,000 in deposits; and C. Stirling Smith, former president of the bank, were found guilty of a $450,000 misapplication of funds of the closed bank by a jury in Cleveland, Ohio, on February 9. James H. Cassel, secretary-treasurer of the brotherhood, was acquitted. Messrs. Johnston and Smith were also found guilty of making false entries. They are liable to fines totaling $90,000 and to penitentiary sentences of 30 years on each of the nine counts of the conviction. The Standard Trust Bank was organized in 1930, when it took over the brotherhood's national bank and several smaller institutions. One of the deals involved in that merger, a guaranty of $904,000 of the brotherhood bank's assets to the Standard Trust which took them over, furnished the background for the trial. The state contended that the brotherhood borrowed $450,000 from a New York bank for the benefit of the Cleveland bank but instead of the brotherhood paying the loan, it was paid by the Standard Trust Bank and allegedly false entries were made concerning the arrangement. The defense claimed that payment by the Standard Trust was entirely proper, holding that it was the only beneficiary of the loan.

Canadian National in 1933

The Canadian National reported operating revenues for 1933 of $148,519,742 and after payment of operating expenses net revenues of $5,707,183. Operating expenses were reduced almost dollar for dollar to meet a $12,583,852 decline in gross revenues with the result that the net revenues of the system for the twelve months were only $188,251 under the net revenues for the year 1932.

Close budgetary control of expenditures brought about the reduction in operating expenses during the year. Train services were further reduced, pooled trains were inaugurated, departments were reorganized and other steps taken to meet the situation created by the general decline in traffic.

For the month of December the statement shows operating revenues of the all-inclusive Canadian National System of $12,353,497, an increase of $439,816 as compared with December, 1932. Operating expenses in December, 1933, were $11,644,371 as against $12,049,403 in December, 1932, an increase of $405,032. Net revenues for December, 1933, were $709,126 as against a net deficit in December, 1932, of $135,722.

The summaries of operating revenues, operating expenses and net revenues for the twelve months follow:

	1933	1932	Decr.
Op. rev....	$148,519,742	$161,103,594	$12,583,852
Op. exp...	142,812,559	155,208,160	12,395,601
Net rev...	$5,707,183	$5,895,434	$188,251

Canadian Pacific in 1933

Net earnings of the Canadian Pacific in 1933 totalled $20,862,105, an increase of $772,121 over the $20,089,984 reported in 1932, this being the first increase in a year's net since that of 1928. Gross earnings for the year were lower by $9,667,025 at $114,269,688, but the company was able to effect sufficient economies to reduce operating expenses by fully $10,439,146 to $93,407,583, resulting in the substantial increase in net already noted.

In December, gross earnings at $9,912,738 showed an increase of $211,538 over the $9,701,199 reported a year ago. At the same time, operating expenses were reduced by $724,110 to $6,666,340, leaving the month's net earnings at $3,246,397, an increase of $935,648 over the $2,310,749 reported in December, 1932.

Following are the gross earnings, expenses and net earnings for the month of December and for the 12 months of last year.

DECEMBER

	1933	1932	Decr.
Gross	$9,912,738	$9,701,199	$211,538
Exp.	6,666,340	7,390,450	*724,110
Net profit.....	$3,246,397	$2,310,749	$935,648

TWELVE MONTHS

	1933	1932	Decr.
Gross	$114,269,688	$123,936,713	*$9,667,025
Exp.	93,407,583	103,846,729	*10,439,146
Net	$20,862,105	$20,089,984	$772,121

* Decrease.

Grain Rate Arguments

Oral argument before the Interstate Commerce Commission and a committee of state railroad and utilities commissioners in the western grain rate case, Part 7 of the general investigation under the Hoch-Smith resolution, which was begun on February 7, was expected to be concluded before the week-end. The commission's original decision in this case was rendered on July 1, 1930, to become effective August 1, 1931, but was enjoined by the courts after the commission had declined to allow a rehearing because of changed conditions after the record was closed. All of the

federal commissioners listened to the argument except Commissioner Eastman, who has been relieved of most of his commission duties while holding the office of co-ordinator, but five of the ten had not heard the arguments in the original case in 1929. Chairman Lee and Commissioners Mahaffie, Miller, Tate and Splawn have been appointed to the commission since that time. Among the state commissioners was Homer Hoch, now a member of the Kansas commission, who, as a member of Congress, ten years ago introduced the Hoch resolution, which later became a part of the Hoch-Smith resolution under which the commission initiated the grain rate investigation. The railroads were represented in the argument by A. B. Enoch, R. J. Hagman, R. S. Outlaw, A. B. Mason, P. F. Gault, A. C. Spencer, W. E. Davis, J. N. Davis, P. P. Connell and A. S. Knowlton. They were assigned a total of 900 minutes.

Commends Pennsylvania Railroad

R. L. Lockwood, director, Section of Purchases, Federal Co-ordinator of Transportation, highly commended the spirit of co-operation of the Pennsylvania Railroad in its dealings with the Federal Co-ordinator, in speaking to more than a thousand veteran employees of that road at the annual meeting of the Philadelphia Association, held at the Bellevue-Stratford Hotel, Thursday evening, February 8. In making this statement he referred also to an address Co-ordinator Eastman recently made before a meeting of the Democratic Women's Luncheon Club in Philadelphia, in which he said: "While I have had some differences of opinion with the Pennsylvania management over the Pennroad Corporation, there has been no co-operation so hearty as from the Pennsylvania over other matters."

Two other short addresses were made at the meeting, one by Vice-President A. J. County and the other by General Solicitor E. M. Davis. Mr. Davis referred to veterans as being the bed-rock of an army. He described at some length the serious problems and abuses with which the railways are now confronted and urged the Pennsylvania veterans to use their full influence to solve and correct them. T. George Harper, president of the Pennsylvania System Veteran Employees' Association, General Office, Philadelphia, acted as toastmaster during the ceremonies which followed a buffet supper. Herman Campe of the accounting department was elected president for the coming year. Membership requirements are 21 years or more of active service. The Association has a membership of about 2,600 in the Philadelphia district and upwards of 45,000 on the entire system.

Labor Controversies Taken to White House

Representatives of the Railway Labor Executives' Association called at the White House last week to lay before the President a series of protests because of the failure of six railroads to effect satisfactory settlements of labor disputes which have been the subject of mediation by the Board of Mediation and in some instances of investigations and recommendations by emergency boards appointed by the President. Failing to see the President on that day the labor leaders left their protests with one of his secretaries and it was stated that another effort would be made to bring the matter personally to the attention of Mr. Roosevelt. The railroads concerned are the Chicago & North Western, the Delaware & Hudson, the Kansas City Southern, the Louisiana & Arkansas, the Louisiana, Arkansas & Texas and the Mobile & Ohio.

A strike ballot is being prepared for distribution to the 600 enginemen, firemen and trainmen on the Delaware & Hudson.

On the Chicago & North Western a strike ballot is being taken among employees represented by 13 of the railway brotherhoods. Employees of the other roads have already voted affirmatively on the strike ballot. All of the 21 brotherhoods are affected on the Mobile & Ohio but the dispute on the Kansas City Southern involves only the "big four" brotherhoods.

On both the Delaware & Hudson and the Kansas City Southern the dispute is over a monthly plan for the determination of compensation instead of the standard mileage basis of pay. On the Kansas City Southern a presidential emergency board conducted an investigation, after which President Roosevelt approached the management, but the dispute is still unsettled.

Another presidential board investigated the situation on the Mobile & Ohio, a subsidiary of the Southern, and directed that wage rates be restored, but its recommendation, according to Chairman A. F. Whitney, of the Railway Labor Executives Association, has not been carried out. The Louisiana & Arkansas and the Louisiana, Arkansas & Texas, Mr. Whitney says, has failed to pay standard wage rates, although three separate mediation boards have sustained the contention of the employees.

It Takes a Mathematician To Be a Railway Passenger These Days

The further postponement of action by Eastern railroads on passenger fare reductions continues the muddle on intersectional rates for the traveler from the East into Southern or Western territory where tariffs have been cut. There are so many alternatives in the fares that the passenger might miss his train trying to decide how to buy his ticket. Take a trip from New York to Jacksonville and return, for example. One-way tickets, New York to Jacksonville, are $36.55. A ticket to Washington is $8.14 and from Washington to Jacksonville, $23.68 (good in Pullman), or a total of $31.82. If day coach is used from Washington to Jacksonville at $11.85 the total is $19.99. No reduced round trip tickets except on week ends or excursions are sold for the New York-Washington line, but the round trip New York-Jacksonville with an eighteen-day return limit is $40.65. If tickets are bought en route it can be computed this way: Fifteen-day round trip Washington and Jacksonville, $31.60, plus $16.28 round trip New York and Washington, a total of $47.88; or one-way tickets, Washington to Jacksonville and return, $23.70, plus $16.28 round trip New York and Washington, a total of $39.98. Or would it be better to stay at home or to take a bus?

Carlton A. Shively in the New York Sun.

All Domestic Air Mail Contracts Cancelled

Following a series of conferences with the President and the Department of Justice the Postmaster General on February 9 issued an order annulling all the domestic air mail contracts effective on February 19 and the President issued an executive order under which the air mail service may be conducted largely with the use of planes, pilots, equipment, and facilities furnished by the War Department. The order was issued as the result of disclosures before a Senate investigating committee which, in the belief of the President, showed sufficient evidence of fraud and collusion in connection with the awarding of the contracts to justify such a drastic step. The contracts cancelled cover 26 mail routes and 12 companies. The President's executive order called on the Postmaster General, the Secretary of War, and the Secretary of Commerce, together with other officials of their departments, to co-operate to the end that necessary air mail service be afforded and the Secretary of War was ordered to place at the disposal of the Postoffice Department such airplanes, landing fields, pilots and other employees and equipment of the Army needed for the transportation of mail during the emergency by air over routes and schedules prescribed by the Postmaster General.

The contracts had been designed not only to pay for the transportation of air mail but also to extend subsidies to the air transportation companies to promote the development of commercial aviation.

The charges of collusion are understood to center around a series of conferences between representatives of the Postoffice Department and of the air transport lines called at the request of the Postmaster General in May, 1930.

Producers Increasing Tie Stocks

Reports filed with the Railway Tie Producers' Association by 14 companies which supply approximately 85 per cent of the cross ties produced by commercial firms show that these companies had 6,855,880 cross ties in stock on January 1. This was 584,605 or 9.3 per cent more ties than were in stock in the previous month and 984,081 or 16.8 per cent more ties than were in stock on January 1, 1933. It shows a continued increase in tie stocks since last August, when the number of ties available in the yards of these companies amounted to 5,063,020. The increase since that time is 35 per cent. Prior to August, tie stocks showed a steady decline from January, 1932.

Of the ties available on January 1, 4,610,805 or 67 per cent were 8 ft. long and

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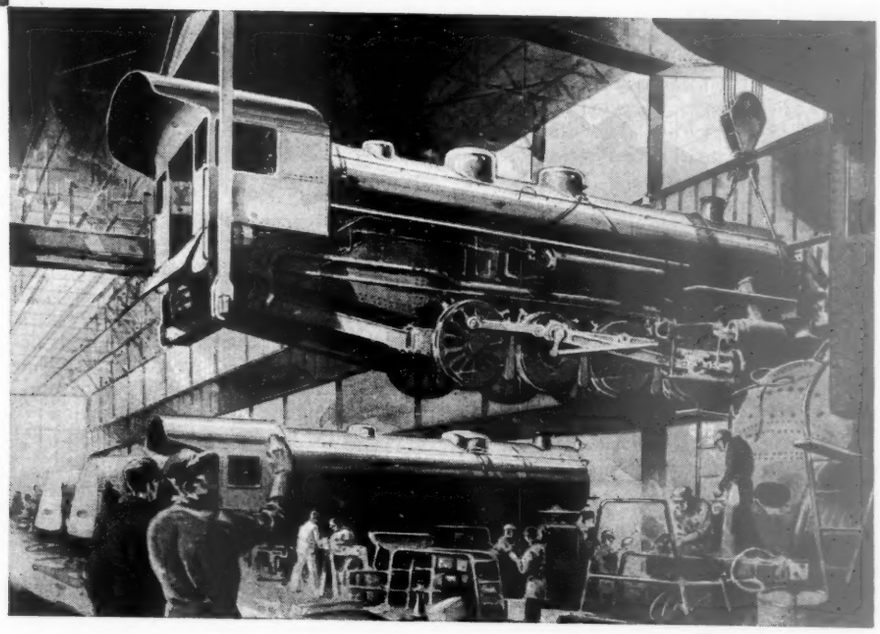
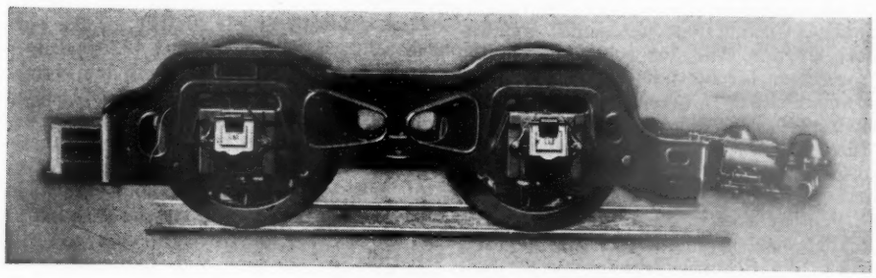
Why

BUILD OBSOLETE LOCOMOTIVES ?



MAKE YOUR *New* LOCOMOTIVES MODERN IN EVERY RESPECT



No air transport could order duplicates of a five year old design and long survive.

Locomotive engineering is also improving constantly. So that duplicates of the last design will now result in equipment that is obsolete before it is delivered.

Obsolete in the sense that locomotives taking full advantage of modern engineering developments such as The Locomotive Booster can produce more transportation at substantially lower cost.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

2,247,075 or 33 per cent were 8 ft. 6 in. long, while 738,645 or 8 per cent of the inventory were U-ties for use untreated, 3,946,265 or 57.5 per cent were oak ties for treatment, and 2,170,970 or 34.5 per cent were other species for treatment. The largest quantity of ties was reported in the district comprising the states of Kentucky, Tennessee, Alabama, Mississippi and that part of Louisiana east of the Mississippi river, the number being 3,049,326, which is contrasted with 2,857,579 in the previous month and 2,326,317 last August. The next largest inventory was reported in the district comprising the states of New York, Pennsylvania, New Jersey, Delaware, Maryland, Ohio, Indiana and Illinois, where 1,729,267 ties were in stock on January 1, as compared with 1,526,520 in the previous month and 1,414,287 last August. The third largest stock was reported in the district comprising the states of Nebraska, Iowa, Kansas, Missouri, Oklahoma, Arkansas, Texas and that part of Louisiana west of the Mississippi river where inventories consisted of 1,490,784 ties, contrasted with 1,233,129 ties in the previous month and 864,036 ties last August.

Construction

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—A contract has been awarded to the Walsh Construction Company, Chicago, for the renewing of the roof of this company's 35-stall enginehouse at Indianapolis, Ind. This work will involve an expenditure of about $35,000.

LEHIGH VALLEY.—The New York Public Service Commission has denied applications of this road for rehearings in the proceedings for the following grade crossing eliminations: Creedon crossing in the town of Newfield, Tompkins county, N. Y., ordered eliminated in 1928 at an estimated cost of $78,000; Ridge road crossing in the town of West Seneca, Erie county, N. Y., to cost about $102,000; Alpine crossing near Alpine station in the town of Cayuta, Schuyler county, N. Y., estimated to cost $92,000; Tioga street crossing in the village of Spencer, Tioga county, N. Y.

LEHIGH VALLEY-PENNSYLVANIA. — The New York Public Service Commission has denied a petition of the Lehigh Valley for a rehearing in the proceedings for the elimination of its Main street crossing and the Main street and Seneca street crossings of the Pennsylvania in Stanley, Ontario county, N. Y. The elimination of these crossings was directed by the commission in 1930 at an estimated cost of $106,852; the plans and estimates have been approved.

THE PENSION ROLL of the Pennsylvania system, at the beginning of 1934, contained the names of 10,505 former active employees.

Equipment and Supplies

More P. W. A. Loan Contracts Signed

Public Works Administrator Harold L. Ickes announced on February 14 that he had signed contracts with the Chesapeake & Ohio, the Erie, the Northern Pacific and the Pennsylvania under which the Public Works Administration will loan them a total of $33,028,000 that will result in the manufacture this year of 11,575 freight cars, 159 passenger cars, 10 steam locomotives and 100,000 tons of rails.

The regenerative effect on the car and locomotive building industries of the orders placed as a result of the loans is indicated by the fact that at the end of 1933 the Class I railroads had orders in for only 1 new locomotive, 224 freight cars and 3 passenger cars. During the entire year they installed only 1 new locomotive, 1,877 new freight cars and 98 passenger cars.

Including these four contracts, $129,168,000 out of the total of $199,607,800 allotted by P. W. A. for railroad loans now has been placed under contract. Since exhaustion of the $3,300,000,000 appropriation for public works construction the Division of Transportation Loans has been pushing contract preparation with all possible speed, and the railroad companies to which allotments were made have been co-operating in the effort to get men back on pay rolls immediately by advertising for bids and placing orders while contract negotiations were in progress.

The contract with the Chesapeake & Ohio is for a loan of $16,876,000 to be used for purchasing 7,800 freight and 26 passenger train cars. The Erie contract covers a loan of $11,282,000 for the purchase of 3,775 freight and 133 passenger train cars. The contract with the Northern Pacific is for a loan of $1,220,000 to be used for the purchase of 10 new locomotives, and the Pennsylvania contract is for a loan of $3,650,000 for 100,000 tons of rail. Contracts for another loan of $77,000,000 to the Pennsylvania with which it is building 7,000 freight cars and 101 electric locomotives and completing the electrification of its line between Washington and Philadelphia had been signed.

Manufacture of the cars and locomotives to be bought by the C. & O., Erie and Northern Pacific will create 4,738,000 man-hours of employment in car and locomotive building plants in several states and at least twice as many man-hours of employment in iron and steel mines, blast furnaces, rolling mills, air brake and car wheel manufacturing plants, paint factories and other industries where raw and finished materials will be produced. The C. & O., Erie and Northern Pacific had obtained competitive bids from car manufacturers and locomotive builders and had awarded contracts for building all the equipment, subject to confirmation after signing of the P. W. A. contracts.

The Pennsylvania already had awarded contracts for rolling the 100,000 tons of rail to be purchased by it. The work will be done by the Bethlehem, Inland, Carnegie and Illinois steel companies.

The contracts with the C. & O., Erie and Northern Pacific are for somewhat smaller amounts than was originally allotted for loans to them. The allotment to the C. & O. was for $18,290,000, to the Erie $11,964,000 and to the Northern Pacific $1,250,000. The allotments were made on the basis of the estimated cost of the equipment, but since then the companies have obtained competitive bids which are lower than the estimated costs.

The $3,650,000 to be loaned to the Pennsylvania for purchasing new rail will be charged against the $41,000,000 blanket allotment set aside by P. W. A. for loans to railroad companies desiring to purchase rail at the price of $36.375 per ton, announced by the manufacturers after conferring with President Roosevelt and Coordinator Joseph B. Eastman. Contracts now have been signed by Administrator Ickes covering $7,953,905 of this blanket allotment, and they will result in the manufacture of 170,514 tons of rail and several thousand tons of fastenings. Other contracts are in course of preparation.

Security for the loans to the C. & O., Erie and Northern Pacific will be equipment trust notes covering the cars and engines to be built. Security for the loan to the Pennsylvania will be collateral trust notes, which will be secured in turn by the pledge of stocks owned by the Pennsylvania.

The Public Works Administration has also announced an advance of $425,000 to the New York, New Haven & Hartford on its loan of $3,500,000.

LOCOMOTIVES

THE PITTSBURGH & WEST VIRGINIA has applied to the Interstate Commerce Commission for approval of an expenditure of $331,000 to be borrowed from the P.W.A. for the purchase of three locomotives.

FREIGHT CARS

THE WESTERN MARYLAND is inquiring for from 20 to 25 steel caboose cars.

PASSENGER CARS

THE ERIE is now inquiring for eight combination passenger, baggage and mail cars.

THE NEW YORK, NEW HAVEN & HARTFORD has issued inquiries for a streamlined train.

THE UNION PACIFIC has placed an order with the Pullman Car & Manufacturing Corporation for three additional streamlined articulated aluminum passenger trains. One is a six-car train composed of mail and baggage cars, a 56-seat coach and 3 Pullman sleeping cars and propelled by a 900-hp. Diesel engine. The other two are nine-car units, each with mail and baggage cars, coaches and sleeping cars, and propelled by 1,200-hp. Diesel engines.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Safety Car Heating

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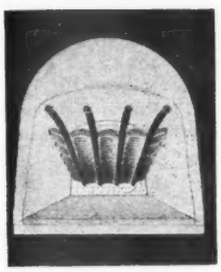
There Are *Two Sides* To Arch Brick



There's More to SECURITY ARCHES *Than Just Brick*

To give a long, economical life, Arch Brick must embody experience of two different kinds.

FIRST, the experience of the railroad man with locomotive combustion. For twenty-five years, the American Arch Company has specialized in the study of railroad conditions in relation to Arch Brick.

SECOND, competent brick makers possessed of high-grade clay deposits and backed by sound experience in refractory manufacture.

HARBISON-WALKER REFRACTORIES CO.
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NORTH AMERICAN REFRACTORIES CO.
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IRONTON FIRE BRICK CO.
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DENVER SEWER PIPE & CLAY CO.
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ATHENS BRICK & TILE CO.
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GLADDING-McBEAN & CO.
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DIAMOND FIRE BRICK CO.
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DOMINION FIRE BRICK & CLAY PRODUCTS LTD.
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Ontario, Canada—Quebec, Canada

LOUISVILLE FIRE BRICK WORKS
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NRA MEMBER U.S. WE DO OUR PART

The above companies provide the second part of the combination. They serve the railroads thru the American Arch Company exclusively, thus completing a well-rounded Arch Brick service.

AMERICAN ARCH COMPANY

INCORPORATED

Locomotive Combustion Specialists

NEW YORK CHICAGO

& Lighting Company air conditioning equipment for 30 combination Pullman observation sleeping cars and 10 additional Santa Fe lounge and cafe cars in addition to 26 cars reported to be air-conditioned in the *Railway Age* of January 27. The cars include 2 cafe observation, 8 club, 3 ten-section sleeping-observation, 14 three-compartment two-drawing-room observation and 13 three-drawing-room six-compartment cars. The 66 cars will be used on the Chief, the California Limited and the Ranger and between Kansas City, Mo., and Tulsa, Okla., and between Barstow, Cal., and San Francisco.

THE NORFOLK & WESTERN will equip four of its ten new coaches with steam-ejector air-conditioning equipment furnished by the Safety Car Heating & Lighting Company, and six of the new coaches will be equipped with electro-mechanical air-conditioning equipment furnished by Frigidaire Corporation. The eight new combination passenger and baggage cars will be equipped with electro-mechanical air-conditioning equipment furnished by Westinghouse-Sturtevant. These cars were ordered from the Bethlehem Steel Company as was reported in the *Railway Age* of February 3; six existing dining cars which are to be rehabilitated will be equipped with electro-mechanical air-conditioning equipment of the Frigidaire Corporation. All of the cars will have Safety Car Heating & Lighting Company's axle-driven electric power plants of 15 kw. capacity except the four coaches with steam-ejector air-conditioning equipment, which will have 10 kw. capacity.

THE CHICAGO & NORTH WESTERN has placed an order with the Pullman Car & Manufacturing Corporation for the installation of air-conditioning apparatus in 11 passenger cars. It is also planning the purchase of air-conditioning apparatus for installation in 14 passenger cars in its own shops. The equipment in which the Pullman Car & Manufacturing Corporation will install air-conditioning apparatus is as follows: One nine-room sleeping-observation car, two bedroom-observation cars, two club cars, one observation car, one one-room, three-drawing room six-compartment sleeping car, two lounge-observation cars and two limousine-parlor cars. Mechanical air-conditioning apparatus will be installed in all the cars with the exception of the two bedroom-observation cars and the two limousine-parlor cars, in which the ice system of air conditioning will be installed. The cars in which air-conditioning apparatus will be installed in company shops include 10 dining cars, 2 observation-cafe-lounge cars, and 2 mid-train lounge cars. Mechanical apparatus will be used.

These cars will be used on three of the Pacific Coast trains, the Overland Limited, the Los Angeles Limited and the Portland Rose; on the Corn King Limited between Chicago and Omaha, Neb., and Sioux City, Iowa; on the Northwestern Limited between Chicago and St. Paul, Minn.; on the Duluth Superior Limited between Chicago and Duluth-Superior; and on the Columbine between Chicago and Denver, Colo. The cars thus equipped will supplement the five dining cars now air conditioned and in service.

IRON AND STEEL

Pennsylvania Places $3,000,000 Order for Steel Products

Moving forward on the various phases of its comprehensive employment and improvement program financed by the Public Works Administration, the Pennsylvania on February 14 placed orders involving an expenditure of more than $3,000,000 for steel to be used in the construction of 7,000 new freight cars in its shops at Pittsburgh, Pa., Altoona and Harrisburg. Involving 72,000 tons of steel bars, plates, sheets, wheels, axles and miscellaneous shapes, the orders were distributed among 21 companies and represent one of the largest steel purchases made by any railroad in recent years.

Combined with steel orders for roadway electrification work, this order brings the railroad's total order for steel in the last two days to over $4,000,000.

Hundreds of men will return to regular employment in steel mills scattered throughout Pennsylvania and Ohio as a result of this new construction made possible by government cooperation with the railroad.

In addition to increased employment in the industries, more than 1,200 railroad men are returning to active duty in the railroad shops to build the new freight cars.

The following steel companies shared in the order placed on February 14: American Sheet & Tinplate Co., Pittsburgh, Pa.; Apollo Steel Company, Appollo, Pa.; Armco Railroad Sales Company, Butler Pa.; Bethlehem Steel Company, Johnstown, Pa., and Buffalo, N. Y.; By-Products Steel Corporation, Coatesville, Pa.; Carnegie Steel Company, Pittsburgh, Pa.; Central Iron & Steel Co., Harrisburg, Pa.; Corrigan-McKinney Steel Company, Cleveland, O.; Jones & Laughlin Steel Corporation, Pittsburgh, Pa.; Lukens Steel Company, Coatesville, Pa.; Otis Steel Company, Cleveland, O.; Phoenix Iron Company, Phoenixville, Pa.; Republic Steel Corporation, Youngstown, O. and Buffalo, N. Y.; Sharon Steel Hoop Company, Sharon, Pa.; Superior Steel Corporation, Carnegie, Pa.; Weirton Steel Company, Weirton, W. Va.; West Leechburg Steel Company, West Leechburg, Pa.; Wheeling Steel Corporation, Steubenville, O.; Alan Wood Steel Company, Conshohocken, Pa.; Worth Steel Company, Claymont, Del.; Youngstown Sheet & Tube Co., Youngstown, O.

THE BANGOR & AROOSTOOK has placed an order for 3,500 tons of 100 lb. A. R. A. type "A" rail with the Bethlehem Steel Company, and also placed orders with various concerns for about 1,000 tons of fittings to go with these rails.

THE SOUTHERN has placed an order with the Tennessee Coal, Iron & Railroad Company for 10,000 tons of rail, 5,000 tons of which are for the Cincinnati, New Orleans & Texas Pacific and 5,000 tons for the Alabama Great Southern.

MISCELLANEOUS

Power Machinery for Pennsylvania Electrification

Contracts, aggregating about $1,250,000 for major electrical equipment, were let on January 31, by the Safe Harbor Water Power Corporation. These include a 35,000 kv.-a. water wheel generator, and four 20,000 kv.-a. single-phase transformers, to be built by the General Electric Company, and a 31,250 kv.-a. frequency converter and miscellaneous switch gear equipment from the Westinghouse Electric Manufacturing Company. The water wheel generator will develop 25-cycle power and the frequency converter will convert 60-cycle, 3-phase power to 25-cycle, single-phase. The output of both machines will be transmitted from Safe Harbor, Pa. to the Pennsylvania's high-tension lines at Perryville, Md.

* * * *

In the South Omaha (Neb.) Yards of the Union Pacific

Continued on next left-hand page

Unserviceable superheater units are received at the Elesco plant in all kinds of condition. Only the sound material is used again in the remanufacturing process.

Return bends, forged from the tubing itself, assure strength and efficiency.

Every Precaution Is Taken

in Remanufacturing Superheater Units

Every remanufactured unit is given a 1000-pound hydrostatic test before it is returned to you. An example of the great care taken throughout the entire operation of remanufacturing superheater units.

The significant fact about the Elesco unit remanufacturing service is that remanufactured units are built-up only from sound tubing, using the same care, the same precision methods, and the same inspection and testing, as in the manufacture of new units.

When received at our plant, unserviceable units are dissembled, and only the tubing material still in sound, serviceable condition, is retained. Consequently, when returned to you as remanufactured units, they are as complete in every detail as new units.

Having unserviceable superheater units remanufactured is your assurance of full-capacity, trouble-free superheating service from shopping to shopping . . . . and the cost is less than half that of replacing with new units.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

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Canada: The Superheater Company, Limited, Montreal

Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Throttles

Supply Trade

John J. O'Fallon of the **O'Fallon Company,** St. Louis, Mo., has been appointed representative of the **Ross & White Company,** Chicago.

William B. Joyce, Beverly, Mass., and the **Associated Manufacturers' Agencies,** Louisville, Ky., have been appointed representatives of the **Northwestern Motor Company,** Eau Claire, Wis.

Harold B. Ressler, vice-president in charge of sales of **Joseph T. Ryerson & Son, Inc.,** Chicago, has been transferred to New York to take charge of the company's Jersey City plant and will take over the duties of **J. A. McNulty,** who has resigned as manager of the Jersey City plant.

The Ross & White Company, Chicago, has executed a contract with **Wonham, Inc.,** 44 Whitehall street, New York, whereby the latter will act as the export sales manager for the Ross & White Company in foreign countries for locomotive coal, sand and cinder plants and equipments. **Fred S. Wonham** is president of Wonham, Inc.

Air Reduction Company Annual Report for 1933

With a 1933 gross operating income of $13,443,834, as compared with $11,730,889 in the previous year; the Air Reduction Company also reported for last year an increase in net profit after all charges, including federal taxes, the 1933 figure for this latter item being $3,192,732 as compared with $2,293,760 in 1932.

Last year's earnings were, therefore, equivalent to $3.79 per share on 841,288⅝ shares of the company's stock outstanding as compared with $2.73 per share earned in 1932. Current assets at the close of last year totaled $14,384,675, including $6,763,094 in cash, as compared with total current liabilities of $1,688,187.

The consolidated income statement of the Air Reduction Company for the year ending December 31, 1933, follows:

Gross Operating Income	$13,443,833
Operating Expenses	8,723,620
Operating Income	4,720,213
Other Income	518,079
Net Income before Reserves	5,238,292
Operating Reserves (for depreciation of fixed assets)	1,599,524
Net Profit before Federal Taxes	3,638,768
Federal Taxes	446,036
Net Profit Earned on Outstanding Stock	$3,192,732

Chicago Railway Equipment Company

The annual report of the Chicago Railway Equipment Company for 1933 shows a net loss of $115,935, as compared with a net loss of $380,371 in 1932, and a net loss of $525,003 in 1931. Of the loss in 1933, $65,935 is from operations, after deductions for manufacturing, selling and administration expenses and adjustments for income from investments, rentals, etc., while $50,000 results from the provision for depreciation of plant and equipment. The consolidated earned surplus account shows a balance of $35,273. Current assets total $2,095,004 and current liabilities $81,717.

General Railway Signal Company Annual Report

The General Railway Signal Company, for the year ending December 1, 1933, reported a net loss of $24,120, after all charges including depreciation and amortization as compared with a 1932 net income after all charges of $634,665.

The company's current position remained unusually strong. The balance sheet as of the close of last year shows total current assets of $5,131,149 as against total current liabilities of only $240,849. Cash alone, among the current assets, amounted to $1,001,830 while $1,008,031 was carried in United States government securities.

The report shows that the dollar value of all orders booked in 1933 was 81.4 per cent of that in 1932 and 14.4 per cent of the average annual bookings for the ten year period ending December 31, 1932. Of the orders booked last year, 25.7 per cent were for new signaling projects and 74.3 per cent for repairs and renewals; the dollar value of the former was 48.5 per cent of that in 1932 and only 5.2 per cent of the average annual bookings for such projects during the 1922-1932 decade.

The profit and loss and surplus accounts for the year ending December 31, 1933, are shown in the accompanying table.

General Railway Signal Company

PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED DECEMBER 31, 1933

Gross Operating Income, before Depreciation		$778,312
Selling, Administrative and General Expenses		601,716
		176,596
Interest, Dividends and Miscellaneous Income		94,765
		271,361
From which deduct:		
Depreciation and Amortization	$295,480	
Loss on Sales of Marketable Securities	$75,739	
Less Appropriated from Reserve	75,739	 295,480
Net Loss for Year		$24,120

SURPLUS ACCOUNT

Earned Surplus:		
Earned Surplus as at December 31, 1932		$2,414,917
Net Loss for Year ended December 31, 1933		24,120
		2,390,798
Dividends paid, less dividends on Treasury Stock:		
Preferred—6%	$138,228	
Common—$1.00 per share	320,700	458,928
Earned Surplus as at December 31, 1933		1,931,870
Paid-in Surplus		1,734,451
Total Surplus as at December 31, 1933		$3,666,321

Lima Locomotive Works, Inc., Annual Report for 1933

The Lima Locomotive Works, Inc., for the year ending December 31, 1933, reported a net loss of $646,894, after all charges, including depreciation and federal capital stock taxes. This compares with 1932 and 1931 net losses, respectively, of $890,537 and $1,414,129.

The company's current position remains unusually strong. It has no bank or other loans, and against total current liabilities of $129,331 it had, at the close of last year, total current assets of $5,060,381, including $267,512 in cash and $1,522,719 in United States government securities.

Also the company, with no bonded debt, has but one class of stock, 600 shares of which were purchased during 1933, at a cost of $6,225; at the close of last year the company had in its investment account 41,400 shares of its own stock carried at cost ($787,891) and representing 19.62 per cent of the 211,057 shares issued. The market value of this investment at the close of the year was $1,117,800 or $329,909 in excess of cost.

During 1933 the company completed the building of electric locomotives which has been carried over from 1932. "The need for large-scale buying of locomotives by the railroads of the country due to obsolescence and to the increasing demand for greater speed and more economical operation is greater today than it has been for many years," the report says in closing. . . . "Carloadings have shown a definite improvement, with minor interruptions, throughout 1933, and this tendency has been accentuated thus far in 1934. Extensive purchases of locomotives and cars would go far toward increasing the output of capital goods, which is such a vital part of the plan of the federal government to reduce unemployment."

TRADE PUBLICATION

TIMKEN ENGINEERING JOURNAL.—The Timken Roller Bearing Company, Canton, Ohio, has published a 266-page loose leaf book containing general information concerning the various types of Timken bearings. The book first outlines the principles entering into the design of bearings and then describes and illustrates the various types of Timken bearings that are in standard production. The next section explains the new load ratings conforming to the fatigue life of the bearings and also gives the methods of calculating loads and selecting bearings. This is followed by a statistical presentation of the bearings available in the various types, while the next section, consisting of more than 100 pages, is known as the Dimension Sheet Section and contains full-size drawings of the various bearings identified by series numbers and the normal bore. The remainder of the book contains information regarding miscellaneous parts and the mounting and lubrication of Timken bearings.

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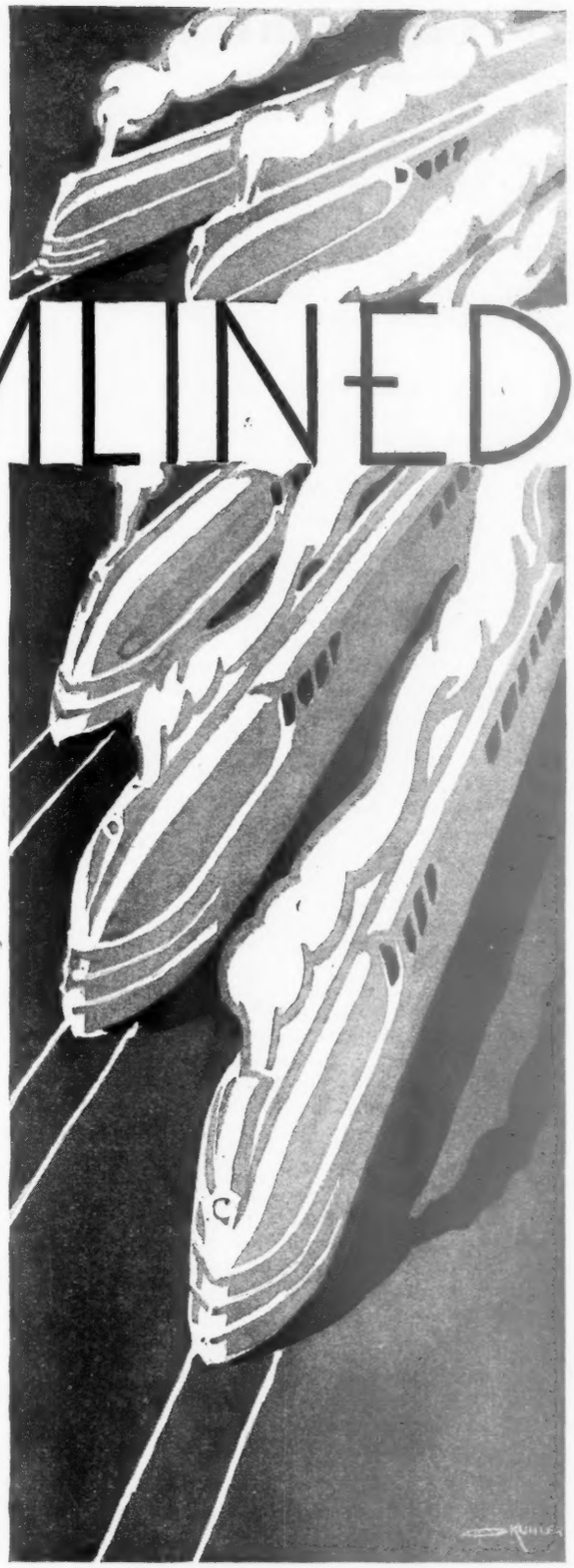

STREAMLINED

UNDOUBTEDLY--

Where conditions are favorable, the light weight streamlined train is going to come into the railroad picture.

but

Is it fair to yourselves or your stockholders to condemn the steam locomotive in general on the basis of what you are doing now with an obsolete main line locomotive far too heavy and costly in operation and maintenance for the service in which it is operating?

If you have a sum of money to spend to improve a certain service, why not find out what the steam locomotive designer has to offer?

You might be surprised at the money you can save.

AMERICAN LOCOMOTIVE COMPANY

We are prepared to submit streamlined designs, steam or diesel powered as desired, to meet any or every demand of our railroads.

30 CHURCH STREET · NEW YORK · N·Y·

Financial

ATCHISON, TOPEKA & SANTA FE.—*Abandonment.*—The Interstate Commerce Commission has authorized this road to abandon the northernmost portion of its Blossburg branch extending from Swastika, N. M., to Brilliant, about 3.5 miles.

BOSTON & MAINE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon operation of parts of a line extending from Hudson, N. H., to Fremont, 21 miles, and from Epping to West Gonic, 18 miles. The railroad proposes to keep in operation segments between Nashua and Hudson, 2.5 miles; Fremont and Epping, 4.5 miles; and West Gonic and Rochester, 2 miles.

CANADIAN PACIFIC.—*Dividends Passed.*—Directors of the Canadian Pacific in Montreal last week decided against declaration of dividends on either the preferred or the common stock for 1933. An official statement issued after the meeting was as follows: "While the directors are naturally gratified at the improvement in the company's earnings which began in December last, the results of the operations of the year 1933 do not warrant the declaration of dividends on the preference or ordinary stocks of the company for that year. It is encouraging to note that from the beginning of the year 1934, the company's traffic earnings have shown continued improvement over those of the same period last year, and that present indications point to the probability of this improvement being maintained."

CAROLINA & NORTHEASTERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Gumberry, N. C. to Jackson, 8 miles.

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—Examiner Thomas F. Sullivan of the Interstate Commerce Commission has recommended in a proposed report that this road be permitted to abandon its Spearfish branch extending from Englewood, S. D., to Spearfish, approximately 31.54 miles.

EAST TEXAS & GULF.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its entire line extending from Hyatt, Tex., to Hicksbaugh, 3.6 miles.

GRAND TRUNK WESTERN.—*Modification of Lease.*—The Interstate Commerce Commission has authorized a modification of the lease by which this company controls the Cincinnati, Saginaw & Mackinaw, to provide for a reduction in the rental from $43,225 annually to $1.00. All the stock of the latter line is owned by the Canadian National Realties Corporation, Ltd., a subsidiary of the Canadian National Railways, which controls the Grand Trunk Western.

GULF, MOBILE & NORTHERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $1,000,000 of 5 per cent bonds.

ILLINOIS CENTRAL.—*Pledge of collateral with R. C. C.*—The Interstate Commerce Commission has granted this road permission to pledge with the Railroad Credit Corporation, as collateral security for loans, its equity in certain securities now pledged with the Reconstruction Finance Corporation. Among the securities involved are $14,949,000 of Yazoo & Mississippi Valley gold improvement bonds, $8,024,000 of which were issued and delivered to the Illinois Central prior to the effective date of 20(a) of the Interstate Commerce Act. The commission thus dismissed the application in so far as it pertained to these latter, holding that the Illinois Central did not require I. C. C. approval of its plan to pledge them.

LONG ISLAND.—*Abandonment.*—Examiner M. S. Jameson of the Interstate Commerce Commission has recommended in a proposed report that this road be permitted to abandon its Wading River branch extending from Port Jefferson, N. Y., to Wading River, approximately 11 miles.

LOUISVILLE & NASHVILLE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a branch line from Redding, Ala., to Readers, 5 miles.

NEW YORK, NEW HAVEN & HARTFORD.—*P. W. A. Loan.*—The Interstate Commerce Commission has authorized this company to issue $3,500,000 of 4 per cent registered serial collateral notes to evidence a loan from the Public Works Administration.

PENNSYLVANIA.—*P. W. A. Loan.*—This company has applied to the Interstate Commerce Commission for approval of the expenditure of $3,650,000 for 100,000 tons of rails, which have been ordered, with the proceeds of a loan allotted some time ago by the Public Works Administration, and for authority to issue to the P. W. A. its ten-year 4 per cent notes, secured by pledge of 22,000 shares of stock of the Pittsburgh, Cincinnati, Chicago & St. Louis, and 36,000 shares of stock of the Western New York & Pennsylvania, as collateral.

PENNSYLVANIA.—*R. K. Mellon Directorship Questioned by I.C.C.*—The Interstate Commerce Commission has assigned for hearing on February 16 the application of Richard K. Mellon, of Pittsburgh, for authority to serve as a director of the Pennsylvania, succeeding his father, the late R. B. Mellon. Oliver E. Sweet, director of the commission's Bureau of Finance, had suggested the withdrawal of the application in a letter to counsel for Mr. Mellon, saying that in his judgment Division 4 of the commission would not be able to grant the application because of the "complications" likely to arise, in view of Section 10 of the Clayton anti-trust act, because Mr. Mellon is a director of several corporations which deal extensively with the Pennsylvania and other railroads.

PENNSYLVANIA-READING SEASHORE LINES.—*Abandonment.*—This company has been authorized by the Interstate Commerce Commission to abandon a 2,665-ft. segment of its Williamstown branch in Gloucester county, N. J.

PERE MARQUETTE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Elmdale, Mich., to Freeport, 6.19 miles.

PIONEER & LAFAYETTE.—*Acquisition and Operation.*—The Interstate Commerce Commission has authorized this company to acquire and operate 13 miles of the 43.3-mile line of the Toledo & Western, the abandonment of which has been authorized. The new company is also permitted to issue 250 shares of no-par-value stock from the sale of which it proposes to raise the necessary purchase money for the line and a gasoline locomotive. Another portion of the former Toledo & Western has been acquired by the Ohio & Morenci.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—The Interstate Commerce Commission has authorized the trustees to abandon the Marquette branch, in Cape Girardeau and Scott counties, Mo.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—The Interstate Commerce Commission has authorized the trustees of this road to abandon its Stanley branch extending from Olathe, Kan., to Stanley, 8.4 miles.

SOUTHERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a portion of a branch line extending from a point approximately three-quarters of a mile west of the Oliver Springs, Tenn., station northwesterly to Big Mountain, 2.6 miles.

SOUTHERN PACIFIC.—*P. W. A. Loan.*—The Interstate Commerce Commission has approved the expenditure of $12,000,000 for the purchase of rails, repairs and improvements to equipment and repair of bridges, trestles and culverts with the proceeds of a loan from the Public Works Administration.

SPOKANE INTERNATIONAL.—*Trustee's Certificates.*—E. S. McPherson, trustee of this road, has been authorized by the Interstate Commerce Commission to issue $50,000 of trustee's certificates to be sold at not less than par, the proceeds to be used to provide for continued operation and maintenance of the railway's property. Tentative arrangements have been made for the sale of the certificates to the Canadian Pacific at par.

Average Prices of Stocks and of Bonds

	Feb. 13	Last week	Last year
Average price of 20 representative railway stocks..	47.69	49.57	25.43
Average price of 20 representative railway bonds..	76.65	77.37	57.18

Dividends Declared

Cincinnati, New Orleans & Texas Pacific.—5 Per Cent Preferred, $1.25, quarterly, payable March 1 to holders of record February 15.

Elizabeth & Trenton.—Semi-Annual, $1.00; 5 Per Cent Preferred, $1.25, semi-annually, both payable April 2 to holders of record March 20.

New York, Lackawanna.—5 Per Cent Guaranteed, $1.25, quarterly, payable April 2 to holders of record March 5.

Pittsburgh, Bessemer & Lake Erie.—75c, semi-annually, payable April 1 to holders of record March 15.

Union Pacific.—Common, $1.50; Preferred, $2.00, semi-annually, payable April 2 to holders of record March 1.

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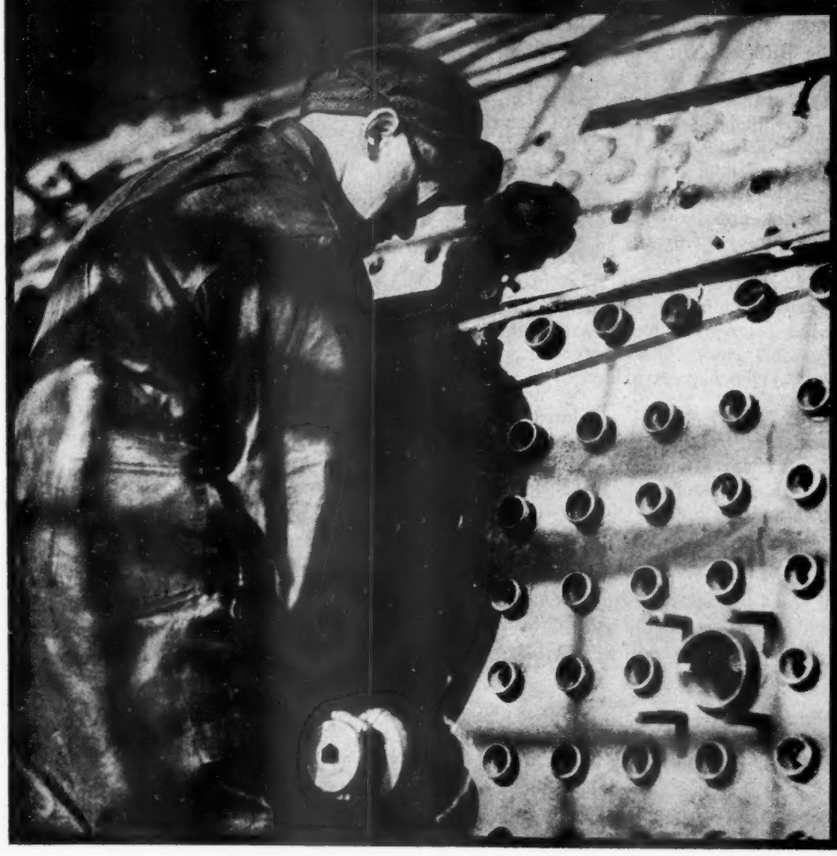
WHAT STAYBOLTS FOR THE MODERN LOCOMOTIVE ?



With boiler pressures above 250 lbs. and firing rates steadily increasing, the job of the staybolt continually becomes more difficult. « « « Fortunately, advances in metallurgy have kept pace with advances in locomotive design and Republic offers in Agathon Nickel Iron a material that is adequate to meet the increased demands placed on staybolts. « « « Corrosion-resistance, added strength and shock toughness to a high degree are all found in Agathon alloy staybolts. « « « Service has proved their superiority. Specify them. « « « « « « « « « « «

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

CENTRAL ALLOY DIVISION, MASSILLON, OHIO

AGATHON NICKEL IRON

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES YOUNGSTOWN, OHIO

AGATHON STEELS

Railway Officers

EXECUTIVE

H. J. Klein, who resigned in 1933 as general superintendent of transportation of the Chesapeake & Ohio, has been appointed assistant to vice-president of this company and the New York, Chicago & St. Louis, effective February 1, with headquarters at Cleveland, Ohio.

J. L. Burns, who has been appoined a vice-president of the Missouri-Kansas-Texas, as noted in the *Railway Age* for January 27, has a record of broad experience in the railroad, public utility and commercial fields. He was born in May, 1880, at Midland, Md., and after some early experience in coal mines and a business college education he entered railway service with the Baltimore & Ohio as a stenographer in the maintenance of way department. Subsequently he held, among other positions, those of secretary to the chief engineer maintenance of way, the general

J. L. Burns

superintendent, and the third vice-president in charge of operation. In 1918, after a short period as chief clerk for the general operating committee, Eastern railroads, American Railway Association, Mr. Burns returned to the B. & O. and in 1919 he left railroad service to enter the public utility field, serving in executive capacities with various companies until 1929 when he became president of the Chemical Limes Company, Bellefonte, Pa. In October, 1930, Mr. Burns entered the service of the Katy as assistant to the chairman of the board of directors and later was appointed also assistant to the president, which positions he was holding at the time of his recent promotion.

OPERATING

M. L. McElheny, whose appointment as superintendent of the Central division of the Central of New Jersey was reported in the *Railway Age* of February 10, page 239, entered railway service as telegraph operator on the Erie and Astabula division of the Pennsylvania, Lines West, in 1897. He was promoted to train dispatcher of the same division in 1902, serving in that position until October of that year, when he left the service of the Pennsylvania to become train dispatcher for the Baltimore & Ohio at Pittsburgh. He served in the latter position until 1915, when he was appointed assistant trainmaster. In 1917 he became trainmaster of the Pittsburgh division and three years later he was transferred in the same capacity to the Connellsville division. He was appointed superintendent of the Baltimore & Ohio, New York Terminals, and the Staten Island Rapid Transit in February, 1924, continuing in that position until his recent appointment as superintendent for the Jersey Central.

J. H. Ball, assistant station master for the Pennsylvania at North Philadelphia, Pa., has been promoted to assistant trainmaster at London, Ohio, succeeding **J. H. Bowers,** who has retired.

O. C. Lott has been appointed terminal trainmaster of the Baltimore & Ohio, with headquarters at Youngstown, Ohio, succeeding **J. J. Kane,** who has been relieved on account of illness.

E. E. McKinley, trainmaster of the New York Terminal lines of the Baltimore & Ohio, has been appointed superintendent of the same lines, with headquarters at St. George, S. I., succeeding **M. L. McElheny.**

The following changes have been made in the operating department of the Southern: **S. S. Brooks,** superintendent of the Washington division, with headquarters at Alexandria, Va., has been transferred in the same capacity to the Danville division, with headquarters at Greensboro, N. C., succeeding **L. H. Woodall,** who has been appointed general superintendent of the Alabama district, with headquarters at Birmingham, Ala., to replace **M. E. Madden,** who has resigned on account of ill health. **C. Hungerford,** superintendent with headquarters at Macon, Ga., has been transferred to the Washington division, with headquarters at Alexandria, Va. He will be replaced by **G. W. Adams,** who was formerly assistant superintendent at Atlanta, Ga. **B. F. Langford,** assistant superintendent at Hattiesburg, Miss., has been transferred in the same capacity to Atlanta, Ga., succeeding Mr. Adams. **A. M. Tipton,** trainmaster with headquarters at Birmingham, Ala., has been appointed assistant superintendent at Hattiesburg, replacing Mr. Langford. **C. W. Pates,** chief dispatcher with headquarters at Somerset, Ky., has been appointed trainmaster at Birmingham, succeeding Mr. Tipton and **F. L. Farmer** will replace Mr. Pates as chief dispatcher at Somerset.

TRAFFIC

C. C. Woodworth has been appointed district freight agent of the Mobile & Ohio, with headquarters at Cincinnati, Ohio.

Raymond S. Feinberg has been appointed to the newly-created position of general agent at Dallas, Tex., for the Alabama, Tennessee & Northern.

L. G. Meder, city passenger agent at Detroit, Mich., for the Union Pacific, has been promoted to general agent, passenger department, with headquarters at Omaha, Neb., succeeding **J. O. Goodsell,** deceased.

John J. Collins, chief clerk in the passenger traffic department of the Missouri Pacific at St. Louis, Mo., has been promoted to general baggage agent with the same headquarters, succeeding **W. H. Bissland** who has retired. Mr. Bissland was born on January 22, 1864, at Gourock, Scotland, and first entered railway service on June 2, 1885, as a clerk in the office of the auditor of passenger accounts of the Atchison, Topeka & Santa Fe at Topeka, Kan. After serving in other clerical capacities on this road, Mr. Bissland went with the Missouri Pacific in March, 1890, as secretary to the general passenger agent at St. Louis. In November of the same year, he was made chief clerk in the passenger department at the same point and in January, 1903, he was advanced to assistant general ticket agent. Five years later, Mr. Bissland was promoted to assistant general passenger agent and in January, 1913, he was made general baggage agent, which position he held until his retirement.

E. P. Burke, general passenger agent for the Pullman Company, who has been appointed passenger traffic manager, as noted in the *Railway Age* of February 10, has been with this company for 34 years. He was born on November 14, 1877, at Chicago and prior to going with the Pullman Company on January 8, 1900, he

E. P. Burke

served with the White Star Line and the Grand Trunk. His first position with the Pullman Company was as a clerk and subsequently he was advanced through the positions of rate clerk and chief clerk. Mr. Burke was promoted to assistant general passenger agent on January 1, 1913, and on May 27, 1925, he was further advanced to general passenger agent. He was holding the latter position at the time of his recent promotion to passenger traffic manager, at Chicago.

Claude T. Hunt, who has been appointed general eastern passenger agent of the Southern, with headquarters at New York, as reported in the *Railway Age* of February 10, was born on May 21, 1899, at Alexandria, Va. He attended the public and high schools of that city and the Temple Shorthand School in Washington, D. C. Mr. Hunt entered railway service

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A Train is Coming-

Imagine a dignified gentleman, wearing knee breeches, riding a horse and carrying a red flag, preceding a railroad train to warn the populace that a train was coming. That was what occurred when the Stockton & Darlington Railroad started operations on September 27, 1825, with Stephenson as engineer.

And try to picture this plodding train of pioneer days, speeding along at the dizzy rate of eight to twelve miles an hour, stopping at crossings to let horse-drawn vehicles have the right-of-way.

Today, the railroads provide for highway crossing safety for high speed operation by installing the modern "Union" Style HC-8 Flashing Light Highway Crossing Signal that gives an unmistakable warning —"Danger, a train is coming." This signal makes possible additional operating economies while it is providing increased safety. May we give you additional information?

Union Switch & Signal Co.

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

with the Southern in October, 1914, as messenger boy in the car record office and

Claude T. Hunt

the office of the superintendent of freight and passenger transportation in Washington, D. C. From January to December, 1917, he served as file clerk in the office of the mechanical engineer, then becoming stenographer in the office of the master mechanic, the chief engineer of construction and the general supervisor of car repairs. He was appointed secretary to the passenger traffic manager in December, 1921, serving in that position until May, 1924, when he became traveling passenger agent. From October, 1929, to March, 1932, Mr. Hunt was New England passenger agent for the Southern at Boston, in which capacity he served until February 1 of this year, when he was promoted to the position of general eastern passenger agent.

MECHANICAL

Clyde B. Hitch, general master mechanic of the Chesapeake & Ohio, with headquarters at Huntington, W. Va., has been appointed assistant superintendent motive power, with the same headquarters, and the position of general master mechanic at that point has been abolished.

William R. Harrison, master mechanic on the Atchison, Topeka & Santa Fe, at Argentine, Kan., has been promoted to superintendent of shops at Albuquerque, N. M., replacing **F. B. Harman,** who has been transferred to San Bernardino, Cal., to replace **A. G. Armstrong,** deceased. **W. P. Hartman,** fuel supervisor at Amarillo, Tex., has been promoted to master mechanic of the Slaton division, with headquarters at Slaton, Tex., succeeding **J. M. Nicholson,** who has been transferred to Argentine, to replace Mr. Harrison.

SPECIAL

T. E. Pratt, chief special agent of the Chicago, Burlington & Quincy, has also been appointed to the same position on the Colorado & Southern, his headquarters remaining at Chicago.

G. E. Patterson, vice-president in charge of operation of the Illinois Central, who has been appointed manager of personnel, as noted in the *Railway Age* of February 3, has been connected with this company for 45 years. He was born on June 23, 1869, in Mason county, Ill., and entered railway service with the Illinois Central on May 8, 1889, serving successively as an agent and telegraph operator until 1903, when he was appointed a division agent. In the following year Mr. Patterson was made an inspector of weights and in 1905 he was promoted to trainmaster. He held the latter position for eight years, at the end of which period he was further advanced to superintendent of the Springfield division, subsequently being transferred to the Louisiana division and then to the Illinois division. In July, 1920, Mr. Patterson was appointed acting general superintendent of the Northern Lines, with headquarters at Chicago, being appointed general superintendent of these lines three years later. In November, 1924, he was promoted to general manager of

G. E. Patterson

the system, with the same headquarters, which position he held until his promotion to vice-president in charge of operation in 1929.

OBITUARY

D. Q. Lewis, assistant general claim agent of the Chicago & North Western, with headquarters at Milwaukee, Wis., died on February 5 at Green Bay, Wis.

Thomas S. Rattle, formerly an assistant general freight agent on the Chicago & North Western, who retired in 1918 as general agent at Denver, Colo., died on February 5.

J. B. Hutchinson, former general manager and assistant to the vice-president of the Pennsylvania, died at his home in Bryn Mawr, Pa., on February 12. Mr. Hutchinson retired from the Pennsylvania in 1914.

William A. Christian, formerly first assistant engineer of the Chicago Great Western, who died on February 4, as noted in the *Railway Age* for February 10, was born on November 21, 1870, at St. Louis, Mo., and was educated in both civil engineering and medicine, although he never followed the latter profession. Early in his career he served a total of two years as a chainman and rodman with the Chesapeake & Ohio, the Baltimore & Ohio, and the Cleveland, Cincinnati, Chicago & St. Louis, later serving as assistant engineer maintenance of way of the latter road. Mr. Christian spent three years as a draftsman with the Stacey Bridge Company, Cincinnati, Ohio, and nine years on the location, design and construction of locks and dams with the government. He entered the service of the Chicago Great Western in 1906 as an assistant engineer at St. Paul, Minn., being promoted to first assistant engineer at Chicago in 1909. Five years later Mr. Christian left railway service to become senior roadway engineer at Chicago, in the Bureau of Valuation of the Interstate Commerce Commission. Following the completion of this work he spent a year with the health department of the City of Chicago, two years in private practice, three years in the engineering department of the Chicago & Western Indiana as an assistant engineer and since 1931 had been connected with the United States Engineer office at Chicago.

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The Atchison, Topeka & Santa Fe's "Navajo" at Wellington, Kan.